

Washoe County, Nevada

EMERGENCY MEDICAL SERVICES SYSTEMS ANALYSIS

FINAL REPORT

August 2012



Prepared by:
TriData Division,
System Planning Corporation
3601 Wilson Boulevard
Arlington, VA 22201

Special BCC Mtg.
A-10/18/12
#6

FINAL REPORT

Emergency Medical Services Systems Analysis *Washoe County, Nevada*

Submitted to:

John Slaughter, Director of Management Services
Kurt Latipow, Fire Services Coordinator
Washoe County Manager's Office
1001 E. 9th Street
Reno, NV 89512

Submitted by:

Philip Schaenman, President
TriData Division, System Planning Corporation
3601 Wilson Boulevard
Arlington, VA 22201
(703) 351-8300

August 2012

Table of Contents

EXECUTIVE SUMMARY	1
ACKNOWLEDGEMENTS.....	6
1. INTRODUCTION.....	9
Understanding of the Problem	9
2. OVERVIEW OF WASHOE COUNTY.....	10
Washoe County Commission Districts	12
Regional Emergency Medical Services Authority.....	20
District Board of Health	23
Previous Washoe County Evaluations/Assessments.....	23
3. STATE OF NEVADA EMS SYSTEM.....	25
State Strategy	25
Current EMS Issues.....	26
EMS Scope of Practice.....	27
4. RESPONSE TIMES AND STATION LOCATION	29
Methodology.....	29
EMS Demand.....	30
Current Response Times.....	32
Measurement Methodology	32
Analysis of Station and Apparatus Locations.....	60
Summary.....	86
5. ASSESSMENTS BY EMS STAKEHOLDERS.....	87
Evaluation Process	87
Results	88
System-wide Results	95
Common Themes	96
6. WASHOE COUNTY DISTRICT BOARD OF HEALTH.....	100
Washoe County District Board of Health.....	100
Health District Internal Report	101
7. EMERGENCY MEDICAL SERVICES – A PROPOSED SYSTEM OF CARE FOR WASHOE COUNTY	103
History of EMS	103
Developing a “Best” System for Washoe County	104
EMS System for Washoe County	105

EMS Medical Direction.....	111
8. INFORMATION SYSTEMS.....	115
A Word About Proprietary Data.....	117
9. EVALUATION OF REMSA CONTRACT	119
Contract History.....	119
Current Ambulance Contractor.....	120
Evaluation of the Current Franchise Agreement	121
10. CHALLENGES AND ADDITIONAL RECOMMENDATIONS	130
System Development and Oversight	130
11. SUMMARY OF RECOMMENDATIONS	138

EXECUTIVE SUMMARY

Washoe County, a large county with a complex EMS delivery system, contracted TriData, a professional EMS, fire, and public safety consultant, to study the delivery of EMS to its citizens. We embarked on an extensive study of EMS emphasizing system component that affect citizens, EMS providers of all levels, EMS agencies, and the medical community.

The Executive Summary is just that, a summary of major findings and recommendations regarding EMS delivery. Before drawing conclusions about our report or its findings, we recommend that readers travel beyond the Executive Summary by investing time into reading the entire report or at least the related sections.

Overall, Washoe County EMS providers at all levels provide timely, high quality response in a professional manner. It is easy to notice the dedication of each participant within the system. The combination of fire first response, with either commercial or fire-based EMS transportation is an appropriate method to provide service. We note throughout the report that most challenges stem from the lack of EMS oversight, with the system operating on a fragmented basis. The lack of system transparency, distrust between system participants, and failure to take advantage of technologies that could solidify system cohesiveness are at the root of most administrative, operational, and financial issues.

Overview of Washoe County

Washoe County is located along the eastern slopes of the Sierra Nevada Mountains. The county covers an area of 6,600 square miles in the northwest section of the state bordering California and Oregon and has a population of approximately 417,000. A long, narrow geography adds to the challenges of providing EMS. While many people reside and work within minutes of high-quality hospital care, others may be required to travel up to 110 miles for care.

Approximately 218,000 residents live in the City of Reno, and another 93,000 in Sparks. The remaining 108,000 reside within the unincorporated areas of the county. Washoe County operates under an elected County Commission/appointed County Manager system. Until 2008, the county was one of the fastest growing in the country. Like most large metropolitan areas in the U.S., 2008 was a financially devastating year for Washoe County and its cities. In 2005, the annual unemployment rate for the Reno-Sparks metro area was just 4.1 percent. By September 2010, that number soared to 13.6 percent, nearly four percent higher than the national average. The financial hardships continue, causing Washoe County leaders to explore how quality EMS service can continue in an effective, cost-conscious manner.

Regional EMS Authority (REMSA) and North Lake Tahoe Fire District (NLTFD) provide full paramedic-level EMS transport, while Gerlach provides EMT-I level transportation (augmented by REMSA). Fire first response is provided at the EMT-I level, except for Sierra that provides paramedic level care. The combined Truckee Meadows/Sierra District is still deciding on the level of service to be provided. REMSA and NLTFD personnel perform at or above the national average for specific skills. Other agencies could not provide the necessary data, but are in the process of upgrading their programs.

REMSA is the primary EMS transport agency for most of Washoe County. They have a sophisticated, high-quality program that encompasses secondary dispatch, paramedic level emergency response and transport, EMS education, and several community programs. They recently received a federal grant to expand their scope of service to community-based care.

State of Nevada EMS System

The Nevada state EMS system, as authorized in NRS 450B inclusive, establishes and enforces standards for out of hospital emergency medical care, ambulance operations, certification of EMS personnel, licensure of attendants and the delivery of trauma care. Most of their direct involvement is with the rural counties. The state concentrates its efforts on regulation of training, licensing, and certification. A 911 Advisory Committee provides guidance on 911 matters.

Nevada is currently promulgating legislation to incorporate the new National EMS Scope of Practice into its laws. The state lead EMS agency is currently development requirements for initial and legacy certification/licensure, scope of practice, transition, and other requirements for each provider category. Washoe County will be closely monitoring the situation because several future decisions will be based on the new scope of practice.

Response Times and Station Locations

We analyzed response times and station locations throughout Washoe County using variables produced by professional organizations as consensus standards. These standards are not absolute, and not meeting these standards does not necessarily equate to poor response.

This chapter includes an extensive evaluation of response time variables. We reported our results using GIS-based computerized maps, and data tables that provided results from various databases, analyzed using sophisticated statistical analysis. There were challenges collecting accurate data that affected the accuracy of our results.

Our analysis revealed that in 2010, there were 86,892 emergency EMS first response and transport calls. We predict an average annual increase of 3.9 percent. By 2014, the total responses may exceed 100,000. There are questions as to the accuracy of this data.

Overall, most response times are good, and are close to the consensus standards used for evaluation. REMSA and NLTFD are operating efficiently. REMSA is compliant with all time zone requirements. Fire department first responder units are appropriately located. REMSA's dynamic deployment model usually provides effective coverage.

Assessments by EMS Stakeholders

Our analysis included a stakeholder assessment that ranked the Washoe County EMS system defined by the U.S. Department of Transportation 14 Attributes for an EMS System. EMS system stakeholders included EMS system chief executive officers, EMS dispatchers, EMS medical directors, EMS officers, and general EMS system members.

The strongest EMS system attributes included clinical care, medical direction, and EMS education. The weakest attributes were communications, EMS legislation, and system finance. There were no significant scoring differences between EMS stakeholder groups.

Washoe County District Board of Health

The Washoe County District Board of Health (DBOH) is the oversight agency for much of EMS. They have complete responsibility for the county ambulance franchise process, but little direct authority over first responder agencies. The DBOH vests day-to-day oversight to the District Health Officer who is a physician, specially trained in public health administration. The District Health Officer advises the DBOH on the public health impact of EMS policy decisions made within the three political jurisdictions of Reno, Sparks, and Washoe County. EMS staff members oversee medical disaster planning activities in support of the DBOH's Multi Casualty Incident Plan and Policy on EMS Coverage for Mass Gatherings, and the Medical and Weapons of Mass Destruction Annexes of the Regional Hazardous Materials Management Plan.

A major DBOH oversight responsibility is to evaluate REMSA, or any franchise organization to assure contract compliance. The District Health Officer produces an annual report evaluating franchise agreement-based metrics including administration, operations, clinical care, and similar measures. We believe that a more comprehensive report with broader evaluation parameters would better measure franchisee performance.

Emergency Medical Services – A Proposed System of Care for Washoe County

EMS in Washoe County is somewhat unique because the delivery of EMS consists of several different types of components attributes: non-transport, fire-based EMS services (career and volunteer), a transport volunteer based service, a transport fire-based EMS service, and the Regional EMS Authority (REMSA), an essentially private ambulance service. While this service is referred to as a Public Utility Model (PUM), the relationship of the Board of Director to the

service itself, more closely resembles a traditional private service with an exclusive franchise agreement and held to certain performance standards.

The future of EMS in Washoe County should include a countywide EMS system with responsibility for total system oversight. This oversight includes first responders, transportation agencies, and current all system components. A countywide EMS system could be overseen by the Washoe DBOH or a Washoe County public safety agency. An EMS lead agency should include an EMS Manager and staff and an EMS Medical Director. We include several possible EMS organization models and specify EMS staff requirements.

Information Systems

Our greatest concern involves EMS system data management including response, clinical, financial, and administrative data. There must be one central database that collects data from first responder, EMS transport, EMS education, and healthcare systems. The appropriate data must be available to the public or those with specific needs. The EMS oversight agency should be responsible for overseeing the database. There are concerns about data security, confidentiality, and proprietary data situations. These challenges can be controlled for by the oversight agency.

A consolidated, countywide EMS dispatch center would likely be the most efficient method of providing EMS communications. Alternatively, a *virtual consolidation* using available technologies would be acceptable. Currently, there are dispatch inefficiencies that add to total response times. Reducing dispatch time intervals can save the same amount of time as more stations, more providers, and more vehicles, at a much lower cost. Each EMS provider organization should be required to participate in these endeavors.

Evaluation of REMSA Franchise Agreement

We are very concerned about the status of the REMSA Franchise Agreement. Since 1990, most of the negotiated changes have clearly favored REMSA, limiting the DBOH oversight authority. The EMS system is supposed to resemble a PUM with an independent oversight organization (REMSA), and an independent contractor (RASI). In practice, it is difficult to tell the difference between organizations, with REMSA functioning as a private EMS contractor.

The agreement allows for either a contract rebid or a market share analysis to determine whether the current contractor is retained. Regardless, no more than seven years should go by without a competitive provider selection process. Several metrics identified by the agreement does not provide enough information to fully evaluate the performance of the contractor. Also, the required \$200,000 performance bond is inadequate to protect the citizens from system failure. The minimum performance bond or irrevocable line of credit should be \$1,000,000.

Using arbitration to decide EMS transport fees is an unnecessary surrender of DBOH authority. The oversight agency should have complete discretion of granting a fee increase. If alternative dispute resolution is needed, it should be limited to mediation.

Sections 30 and 31 are of concern. Issues concerning successor financial liability cannot be directly answered because there are many possible succession models. EMS services are encouraged to seek their local legal counsel for guidance. There is a major issue concerning the administrative acknowledgement of DBOH-REMSA modification agreements. We offer suggestions to handle these agreement gaps.

The DBOH-franchisee agreement is in need of a complete overhaul. There must be appropriate checks and balances that assure a fair process that ensures oversight while providing an environment for good patient care in a business friendly environment.

Challenges and Additional Recommendations

We believe that these additional recommendations will best serve Washoe County. Implementing the changes we recommend will not be easy. It will take the development of common ground, participation, and trust between all provider organizations to implement these changes. The chosen EMS oversight organization should commit to funding an EMS oversight organization that includes: an EMS Manager, EMS Medical Director, EMS Information Specialist, and EMS Quality Manager. The total staffing cost is estimated between \$469,976 and \$738,780. The DBOH currently spends \$143,161. Washoe County could stagger these costs by phasing in these positions over time. The county should strongly consider reaching an agreement with REMSA to become the primary EMS education provider for all EMS providers.

REMSA, NLTFD, and Gerlach Volunteer Fire Company should continue to provide EMS transportation to their designated areas. Fire first responder agencies should continue to provide their current level of service until the state determines how they will implement the new EMS scope of practice, and an evidence-based approach is used to evaluate EMS system needs.

Washoe County now has the time, place, and opportunity to make significant changes to its EMS system that will facilitate future growth and success. The current providers are dedicated to providing excellent patient care in a professional manner. Strengthening the EMS system can occur by empowering an oversight agency with the authority to oversee all aspects of EMS. Redesign of the EMS franchise agreement is necessary to shift the balance of power to the oversight agency.

ACKNOWLEDGEMENTS

The government and EMS professionals listed below were especially instrumental in helping SPC/TriData complete this Washoe County EMS analysis. Many of these personnel unselfishly gave their time and traveled significant distances in an effort to be of assistance. Their efforts exemplified the Washoe County EMS system. Special accolades are in order for Kurt Latipow and his staff who whose assistance in coordination of meetings and resources played a vital role in the project's success.

Washoe County and City Governments

John Breternitz	Washoe County Commissioner, District 1
Katy Simon	County Manager, Washoe County
John Slaughter	Director of Management Services, Washoe County
Leslie Admirand	Assistant District Attorney, Washoe County
Geno Martini	Mayor, City of Sparks
Shawn Carey	City Manager, City of Sparks
Stephen W. Driscoll	Assistant City Manager, City of Sparks
Robert A. Cashell, Sr.	Mayor, City of Reno
Robert Chisel	Finance Director, City of Reno
Marsha Cardinal	Washoe County GIS

Washoe County Fire and EMS Community

Michael D. Brown	Fire Chief, North Lake Tahoe Fire Protection District
William Botelho	Fire Chief, Reno-Tahoe Airport Fire Department
Pete Cannizzaro	Fire Chief, Galena Volunteer Fire Department
William Garand	Fire Chief, Red Rock Volunteer Fire Department
Andreas Flock	Fire Chief, City of Sparks Fire Department
Michael Green	Fire Chief (retired), Sierra Fire Protection District
William Gooch	Fire Chief, Gerlach Volunteer Fire Department
Michael Hernandez	Fire Chief, Reno Fire Department
Tim Leighton	Interim Fire Chief, Sierra Fire Protection District
Don Pelt	Fire Chief, Pyramid Lake Paiute Tribe
Andy Koski	Division Chief, City of Sparks Fire Department
Bret Swearingen	Division Chief (retired), Reno Fire Department
Tammy Lopes	Division Chief, Reno Fire Department
Tom Garrison	Division Chief, City of Sparks Fire Department
Charles Moore	Fire Chief, Truckee Meadows/ Sierra Fire Protection District

Michael Schwartz	Battalion Chief, North Lake Tahoe Fire Protection District
Ryan Summers	Battalion Chief, North Lake Tahoe Fire Protection District
Eric Bauer	Captain, Reno Fire Department
Eric Millette	Captain, City of Sparks Fire Department
Dr. Wayne Hardwick	Medical Director, City of Sparks Fire Department
Dr. Lisa Nelson	Medical Director, North Lake Tahoe Fire Protection District
Francine Donshick	Citizen Advocate
Dr. Robert D. Parker	Citizen Advocate
Dennis Jacobsen	President, Reno IAFF Local #731
Alex Kukulus	President, Sierra Fire Protection District IAFF Local #2139
Erik Burke	EMS Representative, Reno IAFF Local #731
Matt Toni	Vice President, Sparks IAFF Local #1265
Kevin Cavanaugh	President, Sparks IAFF Local #1265
Bruce Hicks	EMS Representative, North Lake Tahoe Fire Protection District IAFF Local #2139
Lisa Dalman	Red Rock Volunteer Fire Department
Dave Kerns	Wadsworth Volunteer Fire Department
Dulcie F. Lilly	Lemmon Valley Volunteer Fire Department
Sandi Mori	Washoe County, Fire Services OSS
Maureen O'Brien	Washoe County, Fire Services OSS

State of Nevada EMS Office

Patrick Irwin	EMS Program Manager
Richard "Buck" Fenlason	EMS Region 2 Administrator

Washoe County District Board of Health

Dr. Joseph Iser	District Health Officer
Dr. Randall Todd	Division Director, Emergency Planning and Response
Eileen Stickney	Administrative Health Services Officer
Stacey Akurosawa	EMS Coordinator
Peg Caldwell	EMS Quality Management

Washoe County Medical Community

Gregory R. Boyer	Chief Executive Officer, Renown Regional Medical Center
Mark W. Crawford	Chief Executive Officer, Northern Nevada Medical Center
Dr. Myron Gomez	Chief, Department of Surgery, Renown Regional Medical Center
Elizabeth Mead	Nursing Director, Renown Regional Medical Center

Regional Emergency Medical Services Authority

Patrick Smith	President
Dr. Joseph Ryan	EMS Medical Director
Michael Williams	Vice President, Operations
Jim Gubbels	Vice President
Diane Rolfs	Director, Center for Prehospital Education
J.W. Hodge	Education Manager
Kevin Romero	Director of Special Operations
Allen Dobrowolski	Statistical Specialist

TriData Staff

The following TriData staff and consultants contributed to this project:

Philip Schaenman	President, TriData Division; Corporate Oversight
Dr. Harold C. Cohen	Project Manager
Robin Davis	GIS/Research Analyst
John L. Chew, Jr.	Consultant
Dana J. Bies	Consultant
Maria Argabright	Project Support

1. INTRODUCTION

There were several reasons for Washoe County to request a third party to undertake this comprehensive study of its EMS system. The delivery of emergency medical services (EMS) in Washoe County is a complex undertaking. Its success is based on a delicate balance of fire-based first response, a combination of a commercial and fire department EMS transportation providers, and a district health board that oversees the provision of medical care within the county. Issues involving public safety provision, especially fire services, have a direct effect on the efficiency of EMS delivery. Other recent public safety studies also recommended a comprehensive study of EMS.

Understanding of the Problem

Washoe County, in spite of several remarkable attributes, does not operate a comprehensive, coordinated and integrated EMS system. Many Washoe County stakeholders identified this as a major issue in the delivery of EMS services, and described Washoe County as multiple subsystems. There is no clear lead EMS agency that has oversight over the entire system. The program is fragmented with delivery services operating as independent providers. Data and Information are not shared freely among the services, providing for significant response inefficiencies, as well as distrust among providers. These ineffective relationships require transferring of call data that increase response times.

Medical Direction is fragmented and although each provider service has a local medical director, the unofficial oversight group, the Prehospital Medical Advisory Committee (PMAC) was reported to be ineffective because it is advisory and has no authority to make decision across the system. This results in variable protocols and inconsistent delivery of care. Medical direction is not inherent in all facets of the program.

The EMS model used to provide service delivery is loosely defined and lacks independent county oversight. This has led to claims of questionable oversight strategies, concerns about ethical issues, and the inability to control costs. These claims and insinuations have resulted in perceptions, both real and imagined, of how the major provider organization is regulated.

The lack of a comprehensive integrated countywide EMS system makes it difficult, if not impossible, to address the economic challenges that face Washoe County. An effective system will allow for the removal of many of the mechanical inefficiencies that cannot be addressed under the current configuration, thereby improving the service and reducing the overall cost of the delivery of care.

2. OVERVIEW OF WASHOE COUNTY

To understand the environment in which EMS operates one must understand some fundamental aspects of Washoe County. It is a growing area located along the eastern slopes of the Sierra Nevada Mountains. The county covers an area of 6,600 square miles in the northwest section of the state bordering California and Oregon and has a population of approximately 417,000. The long and narrow geography of the county adds to the challenges of providing EMS coverage throughout the county.

The City of Reno is the largest city in the county, and third largest in Nevada, with a population of approximately 218,000. The City of Sparks is the only other incorporated City in Washoe County, with a population nearing 93,000. There are approximately 108,000 residents who live within the unincorporated areas of the county.¹

Washoe County is governed by a Commission/ Manager form of government. The five-member County Commission provides oversight and policy direction to two Fire Protection Districts and one County General Fund program that provide volunteer fire-based emergency and EMS service within the county. The County Commission's mission is working together to provide a safe, security and healthy community.² Day-to-day operations are overseen by an appointed County Manager. The County Manager is assisted by two Deputy County Managers and a host of department heads.

Like most large metropolitan areas in the U.S., 2008 was a financially devastating year for Washoe County and its cities. Washoe County has been exploring ways to provide its citizens with the same level of fire and EMS service prior to this economic downturn. Compared to similar metropolitan areas, the Washoe County tax base is spread extremely thin trying to continuing to provide citizens with pre-2008 service levels.

Washoe County's economy is principally based in the trade and service sector, with approximately 65% of the work force employed in these occupations. Although gaming and other recreational activities represent a significant portion of the growing economy and assessed valuation, Reno is experiencing gradual diversification of its business base with the expansion of distribution, warehousing, and manufacturing facilities. Approximately 25% of the workforce is employed in the fields of construction, manufacturing, transportation, communications, public

¹ Additional demographic information, can be found on the Nevada State Demographer's website at: <http://nvdemography.org/>

² Washoe County Commission website: <http://www.washoecounty.us/bcc/visions.html>

utilities, and finance related services. Nevada has no corporate or personal income tax, and is a right-to-work state.³

Until recently, Washoe County was part of the fastest-growing state in the nation. But the collapse of the construction sector, combined with a downturn in gaming and tourism, devastated the economy. In 2005, the annual unemployment rate for the Reno-Sparks metro area was just 4.1 percent. By September 2010, that number soared to 13.6 percent, nearly four percentage points higher than the national average. By November 2010, the Reno-Sparks area lost 35,600 jobs, and total employment shrank to 188,300.

In August 2010, The Bureau of Labor Statistics reported that the Reno-Sparks area ranked second to last out of 336 metropolitan areas for its employment rate. There has been a 24 percent decrease since August 2009 in construction employment. With Reno-Sparks posting 21 straight months of double-digit unemployment, the specter of lingering joblessness is weaving itself into the fabric of the area's economic reality. Budget shortfalls for state and local governments already have led to painful cuts in employment and public services such as firefighting, law enforcement and health and human services.

The hemorrhage will continue if high unemployment leads to continued pressure on tax revenue. The unemployed and those who are concerned about losing their jobs will spend less, which in turn reduces collectible sales tax. If that continues to drop off, Washoe County will see a decline in all these public services that people want and depend on for quality of life.

A high jobless rate also can lead to the reduction of a key resource for an area: its people.

Washoe County population growth has been primarily driven by employment growth. According to Jeff Hardcastle, Nevada state demographer, "(Before the downturn), we've been creating jobs, and we've had to essentially import workers to fill those positions."

The U.S. Census Bureau reported that from 2000 to 2005, Washoe County posted a net migration into the area of 7,639 people and a net natural increase in population—measured by births minus deaths—of 2,378. Even after the downturn placed its grip on the area from 2005 to 2009, Washoe still managed to post a net natural increase in population of 2,749 people. Growth in net migration to the area, however, fell 62 percent to 2,940. Between 2008 and 2009 the statewide growth rate fell from first to 17th.

Jered McDonald, an economist with the National Department of Employment, Training and Rehabilitation believes the population decline statewide will continue through 2013. Our economy is based on taxes that revolve around consumption. Revenues have declined as

³ City of Reno. (2012). *Reno Business*. Retrieved from <http://www.reno.gov/Index.aspx?page=119>

consumption has declined, and it's already stressing government services. People are really going to have to get by on less.⁴

Washoe County Commission Districts

Washoe County is divided into five commission districts, each represented by an elected commissioner.

- **District 1** – Incline Village/Crystal Bay.
- **District 2** – Galena, Hidden Valley, Steamboat, Pleasant Valley, Washoe City, Washoe Valley, Franktown, Montreaux, Arrowcreek, and Virginia Foothills.
- **District 3** – downtown Reno, West Sparks, Panther Valley, Golden Valley, the south end of Sun Valley and Raleigh Heights.
- **District 4** – Sparks, Spanish Springs, Warm Springs and Wadsworth.
- **District 5** – portions of Reno and Sparks, Mogul/Verdi on the west, Sun Valley on the east, North Valleys to the California border, and Gerlach to the Oregon border.

Fire and EMS first responder services for the City of Reno and the City of Sparks are provided by traditional municipal fire departments that are governed by their respective city. With some exceptions, fire and EMS service in the rest of the county is the responsibility of local fire districts. Fire districts within the county include: Sierra Fire Protection District (SFPD), Truckee Meadow Fire Protection District (TMFPD), and North Lake Tahoe Fire Protection District (NLTFPD).

Fire districts are completely responsible for the provision of fire and first responder EMS to their areas. A commercial EMS agency or some fire districts provide EMS transport. The NLTFPD is overseen by an elected Board of Fire Commissioners who governs provision of services. SFPD and TMFPD are governed by the County Commissioners sitting as the Board/s of Fire Commissioners. In May of 2000 the Board of Fire Commissioners voted to contract services with the City of Reno through an accord called the Interlocal Agreement for Fire Services. All TMFPD employees were transferred to become City of Reno employees, and TMFPD was managed by the city under stipulations of the Interlocal Agreement for Fire Services.

⁴ Hidalgo, J. (2010, November). Reno 2020: High unemployment over the long haul is the region's top threat. RJG.Com. Retrieved from <http://www.rgj.com/article/J7/20101109/NEWS/11070373/Reno-2020-High-unemployment-over-long-haul-region-s-top-threat?odyssey=nav%7chead>

In October of 2011, the Board of Fire Commissioners voted to end the 12 year agreement, and worked to combine SFPD and TMFPD under a similar interlocal agreement. The county recently hired a fire chief and staff to oversee the combined districts. All employees of SFPD have become TMFPD employees. To support the consolidated districts, the county has increased the fire protection taxes within TMFPD to equal the rate of SFPD.

Legend

Land Ownership

- Federal Land
- State of Nevada Land

Fire Districts

- North Lake Tahoe FPD
- Reno FD
- Sierra FPD
- Sparks FD
- Truckee Meadows FPD
- Washoe Rural

Fire Stations

- NLTPD Career
- RENO Career
- SPFD Career
- WC Volunteer
- SPARKS Career
- TMFPD Career
- TMFPD Volunteer
- WC Volunteer
- NVNG Career
- RENO-TAHOE AIRPORT AUTH
- RENOSPAKRS INDIAN COLONY VOL

Scale

0 5 10 20 Miles

Table

NAME	Career
HUNGRY VALLEY VOLUNTEER FIRE DEPARTMENT	No
NEVADA AIR NATL GUARD FIRE & EMS SERV	Yes
NORTH LAKE TAHOE FIRE STATION 11	Yes
NORTH LAKE TAHOE FIRE STATION 12	Yes
NORTH LAKE TAHOE FIRE STATION 13	Yes
PLTP FIREHOUSE	No
RENO AIRPORT AUTHORITY FIRE DEPARTMENT	Yes
RENO STATION 1	Yes
RENO STATION 10	Yes
RENO STATION 11	Yes
RENO STATION 19	Yes
RENO STATION 2	Yes
RENO STATION 21	Yes
RENO STATION 3	Yes
RENO STATION 4	Yes
RENO STATION 5	Yes
RENO STATION 6	Yes
RENO STATION 7	Yes
RENO STATION 8	Yes
RENO STATION 9	Yes
SPFD STATION 30	Yes
SPFD STATION 301	No
SPFD STATION 321	No
SPFD STATION 331	No
SPFD STATION 35	Yes
SPFD STATION 351	No
SPFD STATION 38	Yes
SPFD STATION 381	No
SPFD STATION 39	Yes
SPFD STATION 392	No
SPARKS STATION 1 - HEADQUARTERS	Yes
SPARKS STATION 2	Yes
SPARKS STATION 3	Yes
SPARKS STATION 4	Yes
SPARKS STATION 5	Yes
BUTTE FIRE HOUSE	No
TRUCKEE MEADOWS FIRE STATION 13	Yes
TRUCKEE MEADOWS FIRE STATION 14	Yes
TRUCKEE MEADOWS FIRE STATION 15	Yes
TRUCKEE MEADOWS FIRE STATION 16	Yes
TRUCKEE MEADOWS FIRE STATION 17	Yes
TRUCKEE MEADOWS FIRE STATION 18	Yes
TRUCKEE MEADOWS FIRE STATION 223	No
TRUCKEE MEADOWS FIRE STATION 225	No
TRUCKEE MEADOWS FIRE STATION 226	No
TRUCKEE MEADOWS FIRE STATION 227	No
TRUCKEE MEADOWS FIRE STATION 237	No
TRUCKEE MEADOWS FIRE STATION 242	No
WASHOE COUNTY FIRE STATION 240	No
WASHOE COUNTY FIRE STATION 242	No

City of Reno Fire Department – The City of Reno Fire Department is the largest fire and EMS first responder in Washoe County. They are responsible for providing fire and EMS first response for the City of Reno and the TMFPD. Effective July 1, 2012, Reno will no longer be responsible for providing primary fire or EMS first responder services to TMFPD. EMS transportation is provided by Regional Emergency Medical Services Authority (REMSA).

In 2011, Reno responded to 36,057 incidents, with 26,303 being dispatched with an EMS response between the city and TMFPD. The amount of those responses being automatic aid to surrounding districts or services areas was not available.

All Reno primary apparatus is staffed to the EMT-Intermediate level with at least one EMT-I on their units. All volunteer units provide basic life support service, but are capable and at times staffed to the EMT-I level. The volunteer response level could not be quantified.

Prior to the economic downturn, Reno Fire Department had an EMS Coordinator position, and two EMS Captains responsible for an EMS records management and quality management program. These responsibilities have now been absorbed by the Training Chief and one Training Captain who is a paramedic.

EMS Training and Skill Levels: During contract negotiations in 2011, the City of Reno and IAFF Local 731 came to agreement to recognize paramedics within the department. Work is ongoing to develop advanced Life Support first response for the city. There are currently twenty-five certified paramedics and several more in various stages of training and certification/licensure processes. 126 personnel are operating at the EMT-Intermediate level.

Reno was unable to provide EMS skills data for analysis. The fire chief is aware of the problem and has taken steps that will alleviate this shortcoming in the near future. Current NEMSIS reporting upgrades have been implemented, and better data will be forthcoming. Reno Fire Department uses a task book process in which new EMT-Intermediates are evaluated by a currently certified EMT-Intermediate. Most EMS instruction is done in-house and has included Prehospital Trauma Life Support (PHTLS), Advanced Cardiac Life Support (ACLS), and Pediatric Advanced Life Support (PALS). Employees are encouraged to seek other training opportunities.

Every two years, a skills audit is performed by a third party. All providers are tested using the National Registry of EMT's skills testing guidelines, and general knowledge test of Reno Fire Department protocols is administered. Deficiencies are identified and addressed on an individual basis. An American Heart Association Training Center is operated by Reno Fire Department providing course to city employees and citizens on a monthly basis.

Several personnel are Medical Unit Leaders on Incident Management Teams, and are working closely with the National Wildfire Coordinating Group, Incident Emergency Medical Subcommittee on improvement of incident medical operating standards.

Special Services: The RFD provides specialized response for Hazardous Materials, Technical Rescue, Swift Water, Static Water, and Ice Rescue responses within Washoe County, with exception to North Lake Tahoe Fire Protection District and the City of Sparks. Hazardous Materials Regional Response is through a Triad Management agreement between Washoe County, the City of Reno, and the City of Sparks. Several RFD personnel are trained as Medical Unit Leaders on Incident Management Teams. These personnel are working closely with the National Wildfire Coordinating Group, Incident Emergency Medical Subcommittee to improve of incident medical operating standards.

City of Sparks Fire Department – The Sparks Fire Department serves the City of Sparks which is near Reno. They provide EMT-Intermediate level, non-transport first responder service within the City. They respond to approximately 6,300 EMS calls annually. EMS transportation is provided by REMSA. The Sparks EMS Medical Director is an experienced emergency physician who has over 30 years of experience in EMS medical direction. The City has an EMS quality management program that is managed by the EMS Captain, with assistance from an RN who is also an EMS Critical Care Nurse.

Sparks was unable to provide EMS skills data for analysis. The fire chief is aware of the problem and has taken steps that will alleviate this shortcoming in the near future. As this report went to print, the EMS Captain was beginning to accumulate skill data. The medical director and fire chief believe that Sparks and REMSA have a good working relationship that continues to improve. One concern is the lack of system coordination between the first responder and the EMS transport company. Some type of consolidation, possibly virtual consolidation (using technology) should be considered a priority.

Sierra Fire Protection District – The Sierra Fire Protection District (SFPD) provides full service emergency services for the communities of Verdi, Galena and West Washoe Valley as well as Anderson Acres and the west side of the Cold Springs Valley. Effective May 14, 2012, the SFPD staffs four full-time stations providing emergency services 24 hours a day, 365 days a year. The District is also served by five Volunteer Fire Departments that assist the career personnel throughout the District. The District has a resident population of 25,000 and serves a population of up to 42,250.

EMS first response accounts for 57 percent of the SFPD total response load. The District provides non-transport, paramedic-level patient care, with EMS transportation handled by REMSA. Being a mostly rural area, the call volume is lower, and response times are longer. Paramedic level care is provided from four career paramedic companies, three engines and one rescue. These units are augmented by EMT staffed suppression vehicles and support units.

Volunteer companies are available to augment EMS first but data from the Diamonte and ESCI studies indicated they provide less than 2% of responses, and qualification of personnel responding has not been able to be quantified.⁵ We did not receive any requested EMS skills data for analysis.

Truckee Meadows Fire Protection District – The Truckee Meadows Fire Protection District (TMFPD) Board of Fire Commissioners oversees fire and EMS provided for approximately 652 square miles of the unincorporated section of Washoe County, including the communities of Pleasant Valley, Hidden Valley, East Washoe Valley, Lemon Valley, Silver Lake, Sun Valley and Cold Springs. Between July 1, 2000, and July 1, 2012, TMFPD contracted with the city of Reno to fully staff six fire stations. The commission oversees eight volunteer fire stations that provide fire and various levels of EMS. Except for the Gerlach area, EMS transportation is provided by REMSA. TMFPD career personnel provide EMT-I level of patient care. All volunteer first response is at the first responder level, except for the Gerlach and Red Rock VFDs that provide EMT-I care.

On June 28, 2011, the TMFPD Board of Fire Commissioners and the Washoe County Commissioners elected to terminate the Interlocal Agreement with the City of Reno. Effective July 1, 2012, direct operational responsibility transferred back to TMFPD. A transition plan was commissioned and released in August 2011. On April 2, 2012, a new fire chief was hired. Recruitment, hiring, and training of new employees are in progress. The provision of EMS transportation is still being determined. We will comment on this later in the report.

North Lake Tahoe Fire Protection District – North Lake Tahoe Fire Protection District (NLTFPD) is an independent 474 district that is not part of local government. They serve a population of 10,000 year around residents and experience a peak population of up to 70,000 during summers, ski season, or on weekends. The area boasts a healthy senior population, and is considered a high-income area.

Fire district boundaries are approved by the county commissioners. The NLTFPD includes the Township of Incline Village and Crystal Bay. The Fire District is overseen by five elected commissioners who serve staggered two-year terms.

The NLTFD is a career fire department that provides full service EMS response that includes paramedic ambulance transport. The NLTFPD is likely the oldest paramedic service in Nevada and runs at least two paramedic ambulances on a 24/7 basis. Additional ambulances can

⁵ Stouffer, J.A. (2009). *Sierra Fire Protection District, Washoe County, Nevada: EMS program evaluation and recommendations*. Pacific Northwest Associates, LLC.

be cross-staffed for peak demand.⁶ Unlike most communities, 60 percent of EMS calls are for traumatic injuries. This is due to the extensive ski area, and other outdoor recreation activities.

The department is under the command of the Fire Chief who is selected by the Board of Commissioners. EMS is overseen by a Battalion Chief and three shift EMS Captains. Medical direction is provided by a part-time emergency physician, and an RN assists with quality management. Treatment protocols are aggressive, with most care provided under standing orders. On-line medical direction is available but rarely required.

As one of two fire-based EMS transport agencies, quality management is a larger part of the operations. NLTFPD was one of two EMS or first responder agency to provide the requested data concerning skills proficiency. Table 1 shows the skill proficiency for NLTFPD from 2007-2011.

Table 1: NLTFPD EMS Skill Measurement, 2007-2011

Skill	Patient Attempt	Success	Success %
Endotracheal Intubation	19	16	84.21%
Intravenous Therapy	994	914	91.95%
Intraosseous Therapy	6	6	100%

Table 2 compared NLTFPD skill proficiency level to our national database. For endotracheal intubation and intraosseous therapy, the NLTFPD success rate is above the national average. The success rate did not reach statistical significance most likely due to a low number of cases. For intravenous therapy, the success rate was above the national database that did reach statistical significance.

Table 2: Comparison of NLTFPD Skills Proficiency

Skill	Success % NLTFPD	Success % Database	Statistical Significance of Difference
Endotracheal Intubation	84.21%	76.24%	Low (ns)
Intravenous Therapy	91.95%	77.09%	High (p < .0001)
Intraosseous Therapy	100%	82.04%	Low (ns)

The department EMS public safety program is extensive, likely contributing to the high rate of healthy seniors. There are 111 automatic external defibrillators spread throughout the district, one for every 80 residents. The NLTFPD oversees a Public Access Defibrillator (PAD) program to assure these devices are working.

⁶ Cross-staffed means that an engine or truck crew could move to an EMS unit that is within the station. This is also known as first call first staffing.

Gerlach Volunteer Fire Department – Although part of the unincorporated Washoe County fire area, Gerlach provides EMT-Intermediate level EMS transportation to the northern part of Washoe County, approximately 110 miles from Reno. Closing of local industry has led to a decrease in membership, with only two members actually living in Gerlach. According to the fire chief, the remaining members live in the more rural areas. Most responses are in Washoe County, but mutual aid is provided into Pershing or Humboldt Counties. When requested, mutual aid can be provided into California.

Until July 1, 2012 dispatch services were provided by Reno ECOMM, who dispatched Gerlach and transfers the call to REMSA. Effective July 1, 2012, the Washoe County Sheriff has taken over dispatching for Gerlach. After responding and providing patient care, Gerlach VFD transports patients to a meeting point where a REMSA ambulance or helicopter meets the unit and finishes the transport to a Reno area hospital. Ground transport times are approximately two hours, while aeromedical transport takes approximately 35 minutes.

When Gerlach experiences a surge in patients (summer activities), or if members are on vacation, volunteers from other services provide coverage. The current Fire Chief is an EMT-Instructor and provides the necessary continuing education. While membership has decreased, the chief predicts that opening of area gold mines will reverse the trend. He is optimistic about the next five to ten years.

Currently, Gerlach does not charge for ambulance service. Services are funded by the Washoe County General Fund and augmented by VFD fundraising activities. This takes volunteer time that may be better used in training and response availability. Most rural communities have developed traditions of community involvement for fundraising. Requirements for EMS providers may require rethinking and services to consider alternatives. Roughly, charging for EMS transport could yield enough money to reduce member time needed for fundraising.

Recommendation 1: Gerlach VFD should consider the possible benefits for charging fees for EMS transportation. Alternatively, they could make an agreement with REMSA for partial reimbursement.

Unincorporated Washoe County – The county fire suppression program provides support to three volunteer fire departments located outside the boundaries of any of the organized fire protection districts. These three departments provide fire-based emergency response to the communities of Red Rock/Rancho Haven, and Gerlach. Suttcliffe is protected by Pyramid Lake Paiute tribe under contract with the county. The service level in Gerlach includes a fire department operated ambulance. These services are almost exclusively staffed by volunteers.

Regional Emergency Medical Services Authority

In 1986, the Regional Emergency Medical Services Authority (REMSA) was awarded an exclusive franchise to provide all ground and air ambulance services in Washoe County. In 1992, REMSA changed its operation to a “Public Utility Model.” REMSA continues to provide most ground and all air ambulance services in the county. This will be covered in-depth throughout the report.

REMSA is actually an oversight agency that regulates the EMS contractor, Regional Ambulance Service, Inc. (RASI). RASI is contracted to REMSA and is contracted to the Washoe County District Board of Health. We later devote a section to the contract.

REMSA Operations – REMSA is a full-service EMS provider that provides exclusive emergency ground ambulance services for the City of Reno, City of Sparks, TMFPD, and some areas of unincorporated Washoe County. They are the exclusive air ambulance provider for the county. REMSA also provides special services including: tactical EMS (non-weapon carrying), special rescue operations, mass gathering events, search and rescue support, and pandemic planning.

REMSA hires and trains providers at all levels. Some come to REMSA already trained as paramedics or EMTs, while some are hired at baseline level and are trained for job readiness. Many employees start with REMSA at the baseline level and progress through the ranks.

REMSA was one of two EMS agencies to report on the requested EMS skills data. Table 3 shows REMSA EMS skills proficiency for April 2011-April 2012.

Table 3: REMSA EMS Skills Data, April 2011-April 2012

Skill	Patient Attempt	Success	Success %
Endotracheal Intubation	121	94	78.0%
Intravenous Therapy	18,077	16,280	90.06%
Intraosseous Therapy	193	186	96.37%

Table 4 compared REMSA skill proficiency level to our national database. For endotracheal intubation, intravenous therapy, and intraosseous therapy, REMSA success rate is above the national average. The success rate reached statistical significance intravenous and intraosseous therapy.

Table 4: REMSA Skill Proficiency Compared to Database

Skill	Success % REMSA	Success % Database	Statistical Significance of Difference
Endotracheal Intubation	78.0%	76.24%	Low (NS)
Intravenous Therapy	90.06%	77.09%	High (p < .0001)
Intraosseous Therapy	96.37%	82.04%	High (p < .0001)

REMSA is also evaluating whether ET intubation or use of a rescue airway is best for EMS use. Combining ET intubation and use of the King Airway, 279 of 308 (91%) patients needing advanced airway management had a cuffed tube in place prior to hospital arrival.⁷

REMSA Dispatch – In addition to operations, REMSA is the primary dispatch access point for its units. The dispatch center is a state of the art facility that includes call reception facilities, a computer-based Emergency Medical Dispatch (EMD) program, and a base to field radio system. The communications center is staffed by a supervisory system status manager, and three EMDs, all certified in emergency communications, and medical priority dispatch. All EMDs are also paramedic or EMT-Intermediate certified, most having field experience. REMSA dispatch can serve as a back-up facility for Reno EComm.

Another aspect of dispatch is the data collection portion that is used for retrospective analysis and prospective strategic planning. Included is the Mobile Area Routing and Vehicle Location Information System (MARVLIS) program that uses response data to forecast future needs. MARVLIS and other statistical programs are used to determine the best location for units to post. This is known as system status management, a process of dynamic deployment of units. In contrast to most fire-based EMS, dynamic deployment relies on units moving to posts instead of remaining in a static location. Commercial ambulance services tend to use this operational pattern because it may best predict the specific number of units needed to achieve mandated performance goals.

EMS Education and Training – REMSA provides an extensive network of education and training programs throughout the EMS community. The REMSA Center for Prehospital Education teaches subjects including basic life support, advanced life support, special certifications, emergency vehicle operations, and leadership are provided mainly to employees, but also to other community EMS providers. They also work in partnership with local hospitals to assure that appropriate clinical sites are available. REMSA also provides the majority of CPR

⁷ Data from REMSA for April 2011 to April 2012.

and ACLS training for hospitals in the Reno area. In FY 2011, 13,338 students were served by REMSA.⁸

REMSA in the Community – REMSA has a significant community presence, operating many creative programs. It runs traditional community programs such as traffic safety, CPR, and risk reduction for heart disease, and stroke. REMSA is strongly connected to the local National Guard group, providing basic and advanced training for military medics. Their training has led to measurably improved outcomes from trauma.

REMSA was recently awarded a federal Center for Medicare and Medicaid Health Innovation Grant that will combine EMS and other health care partners in expanding the scope of EMS into the community.

The REMSA of Reno, Nevada, a non-profit provider of ground and air ambulance services, in partnership with Renown Medical Group, the University of Nevada-Reno School of Community Health Sciences, the Washoe County Health District, and the State of Nevada Office of Emergency Medical Services, is receiving an award to create a Community Health Early Intervention Team (CHIT) to respond to lower acuity and chronic disease situations in urban, suburban, and rural areas of Washoe County. CHIT is designed to reduce unnecessary ambulance responses, as well as hospital admissions and readmissions, while improving the patients' health care. A central component to the success of CHIT is the adoption of a new non-emergency phone number to provide an alternative pathway to care for patients with lower acuity problems. Goals of this initiative include reductions in non-urgent emergency department visits, unreimbursed emergency department costs, hospital admissions, and hospital readmissions, as well as decreased hospital stays, fewer ambulance transports, and improved overall health care and continuity of care.

Over a three-year period, the Regional Emergency Medical Services Authority's program will train an estimated 22 workers and create an estimated 22 jobs. The new workforce will include community paramedics, communication specialists, an educator, continuous quality improvement coordinators, an outreach coordinator, an information technology specialist, a statistician, an administrative support specialist, and a project director.⁹

The grant is worth close to \$10 million and was one of only four CMS innovation grants that directly related to EMS. REMSA should integrate first responders into this program. The District Board of Health should closely monitor the outcome of this program.

⁸ REMSA. (2011). *REMSA center for prehospital education: Facts and statistics*. Internal Manuscript: Author.

⁹ CMS. (2012). *REMSA Community Health Early Intervention Team (CHIT)*. Center for Medicare and Medicaid Health Care Initiative Awards Profiles, pp. 41-42

REMSA and EMS Medical Direction – REMSA employs a full-time EMS medical director who is integrated in all facets of EMS. This arrangement is a premier case of medical direction being involved in all attributes of EMS. The current medical director came to REMSA with many years of experience as an emergency physician, medical director, and while in Florida implemented one of the first post-residency EMS physician training programs. Arguably, this was the first step in the recent creation of the American Board of Emergency Medicine sub-specialty certification in EMS.

District Board of Health

The District Board of Health (DBOH) was formed in 1972 by an inter-local agreement between Reno, Sparks, and Washoe County. The DBOH was delegated the responsibility of oversight for the quality of care and accountability to the public for REMSA's operation of its franchise. The DBOH appointed a District Health Officer (DHO), is a licensed physician who is responsible to the DBOH, but is independent of the County Commission or the County Manager.

Most of the DHO's responsibility and authority involves REMSA's compliance with the current contractual agreement. There is little to no authority for the DHO to regulate EMS care and quality management throughout the county. In 2011, the DHO made several organizational realignments involving REMSA contract oversight. The Division Director for Emergency Planning and Response now oversees the DBOH's EMS role, and a newly hired EMS Coordinator has begun to perform many of the REMSA contract compliance duties.

Previous Washoe County Evaluations/Assessments

Washoe County has undergone several fire and EMS evaluations during 2009 and 2011 in an effort to devise a systematic approach to providing its citizens with a cost effective and efficient delivery of pre-hospital care. Prior to this report, however, none were specific to the development of a comprehensive countywide Emergency Medical Services (EMS) system.

Two of the more recent evaluations were conducted in 2011 by Emergency Services Consulting International (ESCI). An April 2011 report, entitled "Standards of Cover" focused heavily on fire suppression, specialty response situations and homeland security issues. Emergency Medical Services and prehospital care inclusion in this report was in a more general approach within dispatch and deployment. Moreover, the role of the exclusive contracted transport delivery provider, REMSA, was not a component of this report.

ESCI's second report was delivered in August 2011 and served as a "Transition Plan" for TMFPD's termination of an 11-year Interlocal Agreement with the City of Reno. This Transition Plan outlines actions necessary to accomplish a seamless transfer of all operational responsibility back to TMFPD by July 1, 2012.

In 2009, the Diamante Public Sector Group prepared a report entitled, “Fire and Fire Based Emergency Medical Services Master Plan” for Washoe County that included an assessment of existing operations and a series of recommended methods for improving and/or enhancing existing Fire and Fire-based EMS delivery in the unincorporated areas of Washoe County.

The Fire and Fire Based EMS Master Plan provided us with some valuable background information that is helpful in learning about the Washoe system. Unfortunately, as a review for this current EMS assessment, the Master Plan appears to be a subjective rather than objective assessment; not a benchmarking process nor comparative analysis and has a heavy focus on the fire risk and response, is deficient on EMS, patient care and transport and composed with a fire based service prejudice. It did, however, recommend conducting an independent study of Washoe County’s Emergency Medical Services system (Recommendation S1.5 on page 49 of Master Plan).

Another recent study of dispatch services for the TMFPD, recommending that after the expiration of the service agreement between Reno and Truckee Meadows, TMFPD should transfer dispatch services to the Washoe County Sheriff’s Office.¹⁰

In 2006, Matrix also performed an audit of the Reno Fire Department and TMFPD.

Each previous study provided us valuable information. All research, and recommendations were based on own project team’s data collection and analytical processes.

¹⁰ Schwartz, D. (2012). *Truckee Meadows Fire Protection District: Dispatch service assessment*. Emergency Services Consulting International.

3. STATE OF NEVADA EMS SYSTEM

The Nevada State Emergency Medical Systems program promotes and supports a system that provides prompt, efficient and appropriate emergency medical care, ambulance transportation and trauma care to the people of Nevada. The program, as authorized in NRS 450B inclusive, establishes and enforces standards for out of hospital emergency medical care, ambulance operations, certification of EMS personnel, licensure of attendants and the delivery of trauma care. The program also supports the emergency medical services system for Nevada's rural counties (15 counties) and Washoe County by providing technical assistance, consultation and training to EMS managers and personnel as well as public officials. The state EMS program maintains a registry of all persons certified in Nevada. Additionally, the State EMS Program is responsible for implementation, monitoring, and maintaining a statewide database of hospital emergency care and a statewide EMS radio network.

State Strategy

The state accomplishes its responsibilities by providing technical assistance, consultation, training and regulatory oversight to its county and local systems. There are three regional offices that monitor and provide services emphasizing the quality of training provided. The EMS system also:

- Tests applicants for emergency medical technician certification.
- Issues certification to persons demonstrating appropriate knowledge, skills and abilities in emergency medical care.
- Issues permits for the operation of ambulances, air ambulances and firefighting agency vehicles.
- Licenses attendants to staff ambulances, air ambulances and firefighting agency vehicles.
- Inspects the operations and equipment of ambulances, air ambulances and firefighting agency vehicles.
- Investigates complaints concerning the operations and personnel of agencies involved in the EMS and Trauma Care system.
- Collects and analyzes data concerning out of hospital emergency and trauma care.
- Accesses funding resources such as federal and state EMS grants.

The principal revenue source for the Emergency Medical Systems program is State General Fund Appropriation. The 1997 Legislature authorized the Emergency Medical Systems program to establish a self-supporting fund to provide financial support of training programs for volunteer EMS agencies. Regulations were enacted to establish a fee for issuance of all EMS certifications. Funds will be granted to counties and cities to provide training that will enhance the skills of their volunteer EMS providers.¹¹

Current EMS Issues

We met with the State EMS Program Manager to discuss current issues and challenges that may affect Washoe County EMS. The state has made efforts to place more oversight burden on the counties, but the effort is being slowed by the economic situation. Legally, there is no obligation for local governments to provide EMS. Counties with a population of 1,000,000 or greater can officially move away from state oversight and be self-contained. Clark County (Las Vegas metropolitan area) is the only county meeting the population requirement that is self-regulating)¹².

Dillon's Rule State – Nevada operates as a Dillon's Rule State—counties do not have individual charters and must obtain state legislative approval for major changes. Dillon's Rule government is the opposite of Home Rule that allows counties and cities to charter, giving them greater independence.¹³ Dillon's rule jurisdictions are connected to the state as a child is connected to a parent. Dillon's Rule is used in interpreting state law when there is a question of whether or not a local government has a certain power. Dillon's Rule narrowly defines the power of local governments.

While Dillon's Rule states may be able to exercise greater control over county and local government, such power may lead toward a *walk softly and carry a big stick* philosophy. The state can take minimal action because local governments are subject to legislative approval for the use of significant powers.

Regulatory Activities – State EMS concentrates its efforts on regulation of training, licensing, and certification. A 911 Advisory Committee provides guidance on 911 matters. The State EMS Program can discipline providers or reject applications for certification, but this is

¹¹ NDHHS. (2012, March). Emergency medical services. Nevada Department of Health and Human Services. March 8, 2012. Retrieved from http://health.nv.gov/EMS_EmergencyMedical.htm

¹² Personal Communications, Mr. Patrick Irwin, October 20, 2011

¹³ Nevada Legislature. (2009). *Legislative Commission's Committee To Study Powers Delegated To Local Governments*. Summary minutes and action report. Retrieved from IM-LocalGov-021810-10353.pdf

uncommon. Most actions are taken by local programs and their medical directors. There are state qualifications for EMS medical directors.

EMS Scope of Practice

Nevada is currently promulgating legislation to incorporate the new National EMS Scope of Practice into its laws. The new EMS Scope of Practice provides three major changes to the delivery of EMS. First, it requires EMS practices to be based off of a scope of practice model, instead of an educational/ curriculum-based model. Second, it establishes four specific certification/licensure levels to include:

- Emergency Medical Responder (EMR) (Currently known as First Responder)
- Emergency Medical Technician (EMT) (Currently known as EMT-B)
- Advanced Emergency Medical Technician (AEMT) (Currently known as EMT-I 85)
- Paramedic (Paramedic) (Currently known as EMT-P).¹⁴

The state lead EMS agency is currently development requirements for initial and legacy certification/licensure, scope of practice, transition, and other requirements for each provider category.

The new scope of practice aligns EMS with other medical professions in the manner which it creates and maintains an adequate supply of EMS providers. A roadmap to practice is created that includes four general areas:

1. **Education and Training** – Candidates for all provider levels must successfully complete state-approved training programs from recognized EMS educational organizations.
2. **Certification** – Graduates from approved education and training programs will be required to pass a written and practical examination administered by a professional organization. In Nevada, it will likely be the National Registry of Emergency Medical Technicians (NREMT), but for some levels could be State controlled examinations.
3. **Licensure** – The State of Nevada will approve those certified candidates, who meet other requirements for licensure, to hold a license to practice in Nevada. The State EMS Office could require the candidate to pass a protocol examination or submit other skill proficiency documentation based on which level of licensure is sought.

¹⁴ Personal Communications, State of Nevada EMS Office, Several Conversations

4. **Privileged** – Licensed providers will be required to be granted practicing privileges prior to providing EMS within a jurisdiction. Privileges are granted, modified, or revoked by the EMS system and the local EMS medical director. This is similar to physicians and other health providers being granted hospital privileges.¹⁵

The timing of the scope of practice change is important for Washoe County for several reasons:

1. It will allow Washoe County and its provider agencies to determine which direction to seek concerning provider skill levels.
2. EMS medical directors and EMS managers will determine which optional skill levels will be adopted in Washoe County.
3. After scope of practice issues are determined, EMS constituencies will be able to make evidence-based decisions on which level of service is necessary, and which providers should be practicing those skills.
4. Washoe County and EMS agencies will be able to promulgate an organized plan for the education and granting of practice privileges to EMS providers.

The state EMS office, like other government agencies, has faced recent financial cuts. It desires counties to increase their involvement. With the imminent changes within the scope of practice, State EMS officials will be concentrating on the transitions. State officials would like greater decentralization of the EMS system.

¹⁵ National Highway Traffic Safety Administration.(2005). *The National EMS Scope of Practice Model*. Washington, DC: U.S. Department of Transportation/National Highway

4. RESPONSE TIMES AND STATION LOCATION

This chapter discusses current response times and the deployment of fire and EMS resources and emergency response apparatus in Washoe County. As discussed in the previous chapters, there are many factors that should be considered when determining the appropriate number of stations, including demand for services, population, density of demand and population, size of the jurisdiction, and desired response times. This chapter applies these factors to the current and future situation of the Washoe County.

Methodology

Before any analysis took place, project team members gathered and reviewed information related to properly locating fire stations, including:

- Current apparatus deployment
- National response time standards
- Current response time standards for Washoe response agencies
- Current and projected population
- Current and projected demand and workload

Actual incident data were gathered from Sparks and North Lake Tahoe Fire Departments, Reno Emergency Communications (EComm), and Regional Emergency Medical Services Authority (REMSA). Data included addresses for geocoding, type of incident, units responding, and overall response times.¹⁶ Geographic information system (GIS) files used for the analysis were provided by the City of Reno and Washoe County GIS departments.

A Word about Response Time Assessment – There are many standards, guidelines, and recommendations promulgated by professional organizations, individual agencies, and similar organizations. Response times are often part of performance contracts between municipalities and providers. Scientific validation of response times is just beginning. Any time intervals can and should continue to be questioned.

In most of our studies, we use response time standards promulgated by the National Fire Protection Association (NFPA) or the Commission on Ambulance Accreditation (CAAS). These standards are considered *consensus standards*, devised from peer consensus. While these time

¹⁶ Geocoding is a process by which the street address of an emergency incident is translated into latitude and longitude so that it can be placed onto a map.

standards are not absolute, they are a starting point for evaluating EMS delivery and future response time goals.

EMS Demand

The following represents EMS calls responded to by Washoe County first responder and EMS transport agencies for 2009 and 2010 (and part of 2011). Unfortunately, further statistics were not provided to allow us to perform a trend analysis.

First Responder Agencies – Table 5 describes the EMS response numbers for career fire first responder agencies. In 2009, career agencies ran 38,500 EMS calls, compared to 38,905 in 2010, a 1.0 percent increase. Readers should note that Reno EComm was unable to verify data, that some acknowledged as possibly inaccurate, for the data that it controls. It should be of concern that Reno EComm cannot verify its own data.

Table 5: EMS First Response – Career

Service	2009	2010	2011
Reno	24,478	24,670	25,400 (projected)
North Lake Tahoe	1,179	1,264	1,224 (projected)
Truckee Meadows	5,705	5,999	6,150 (projected)
Sparks	5,363	6,060	6,498 ¹⁷
Sierra	899	957	1,010 (projected)
Total	37,624	38,905	39,552 (projected)

Table 6 describes the 2009-2010 responses by volunteer first responder agencies. The list includes volunteer agencies, mutual aid agencies, and support services. In 2009 these agencies responded to 3095 EMS calls, increasing to 3497 in 2010, an 11.5 percent increase. Readers should note that in the area served by Reno Fire (Truckee Meadows), a career Reno unit was usually dispatched with any volunteer unit. We were unable to differentiate between those responses. Truckee Meadows plans to continue this policy.

Table 6: Volunteer and Mutual Aid First Responder EMS, 2009-2010

Agency	2009	2010
Cal Fire	10	8
Cold Springs Vol. (TMFPD)	414	397
Galena Vol. (Sierra FPD)	21	11
Gerlach Vol. (Washoe County) ¹⁸	420	474
Hidden Valley Vol. (TMFDP)	7	4

¹⁷ Response numbers for Sparks provided directly by SFD.

¹⁸ Washoe County officials clearly believe that this is inaccurate.

Agency	2009	2010
Hungry Valley Vol. (RSIC)	121	142
Lemmon Valley Vol. (TMFPD)	345	314
Lyon County Fire	2	
Nixon Vol. (Pyramid Lake Paiute tribe)	221	356
Palamonio Valley Vol. (TMFPD)	45	40
Peavine Vol. (Sierra FPD)	57	55
Pleasant Valley Vol. (TMFPD)	404	416
Red Rock Vol. (Washoe County)	72	22
Silver Lake Vol. (TMFPD)	155	203
Storey County	33	21
Sutcliffe Vol. (Pyramid Lake Piute tribe)	143	169
United States Forest Service	4	4
Verdi Vol. (Sierra FPD)	148	161
Wadsworth Vol. (TMFPD)	251	297
Washoe County Sheriff's Office	1	1
West Washoe Valley Vol. (Sierra FPD)	58	46
Unknown ¹⁹	163	356
Totals	3095	3497

Table 7 describes the EMS total demand for Washoe County in 2009-2010. This table includes career and volunteer first response and REMSA ambulance. EMS transports for North Lake Tahoe and Gerlach were included in the first responder totals. In 2009, volunteers accounted for 8.26 percent of first response. In 2010, this increased to 9.02 percent.

Table 7: Total EMS Response for 2009-2010

Service	2009	2010
Career First Responses	37,624	38,905
Washoe County Volunteers	3,095	3,497
REMSA ²⁰	41,890	44,490
Total	82,609	86,892

When considering total first response and EMS calls, there was a 3.9 percent increase. Table 8 provides a rough forecast for total EMS calls. Our main purpose in providing this information is to show how a seemingly small increase can be significant.

¹⁹ Unknown are responses that EComm acknowledged that occurred, but the responding agency could not verify which agency responded.

²⁰ REMSA believes that these data are inaccurate.

Table 8: Forecast of Total Demand

Year	Call Forecast
2011	90,241
2012	93,577
2013	96,913
2014	100,249
2015	103,585

Current Response Times

The first step in deployment analysis is a review of department-wide response times. Response time is the total amount of time elapsing between an individual calling 911 and emergency service personnel arriving at the scene. Response time can be broken down into multiple segments for analysis (call processing, dispatch, turnout, and travel time). The following provides some background standards and guidelines and then provides analysis of Washoe county response times.

Response time is one of the most common performance measures used by the fire service because it is understood by citizens, easy to compute, and useful in the evaluation of end results. It is the way most citizens evaluate the level of service provided; though, response time itself really is not a measure of the quality of service, though it does reflect the timeliness of service, which is one attribute desired by citizens.

While demand for services and individual unit workloads dictate how many stations and apparatus are needed in a community (discussed in the previous chapter), response times dictate where specific resources should be placed. Though there is no single set of nationally accepted response time standards, NFPA 1710 provides generally accepted response time standards for career fire departments. NFPA 1720 provide standards for volunteer services. Non-fire based EMS systems often rely on standards set by the Center for the Accreditation of Ambulance Services (CAAS), or the American Ambulance Association (AAA) to determine response time standards. The Reno Fire Department and REMSA have implemented their own response goals and SFPD uses standards set by their fire board. REMSA is also required to meet a contractually guided standard for response time compliance. These standards will be discussed in detail for each respective department.

Measurement Methodology

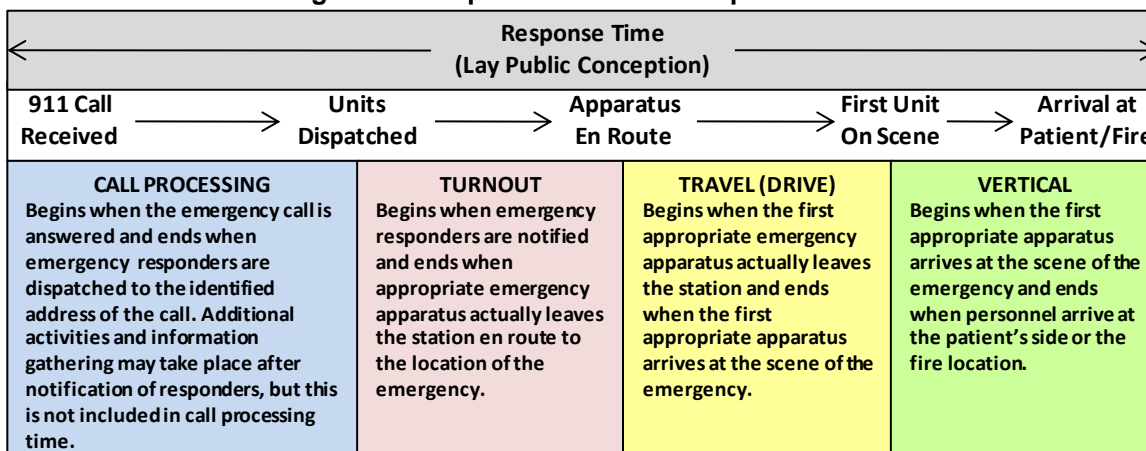
To determine overall response time, the clock starts when an individual calls 911 (or alternate emergency number) and stops when the first emergency provider arrives at patient's side or the scene of the incident.

Several caveats should be kept in mind. First, response times are subject to a variety of measurement errors and only measure one aspect of overall system performance. For example, response times are distorted when units report their arrival on scene either early or late. Second, response times are frequently not comparable across fire-rescue systems because of the differing manners in which they are calculated. Not all departments track vertical response times (that is, the time from arrival on scene to patient contact), so their total response times likely would be lower than the total response times of the few departments that do track them.

Many fire/EMS departments report average response times while others report *fractile* response times.²¹ Reliance on average response times have been deemphasized by emergency service industry because small numbers of very short or long responses—often recorded in error—can distort the results. Also, the public is interested in how fast a system responds in most cases (fractile) rather than average. More and more departments are adopting the 90th percentile for reporting response times (mostly due to industry acceptance of this measure).

A fractile response time of x at the 90th percentile means that units respond in x minutes, or less, 90 percent of the time. The remainder beyond the compliance fractile (90th percentile in this case) is the operational tolerance for the system, meaning the system is designed with the understanding that 10 percent of the calls will have response times that exceed the target. Although it is possible to design a system that may ensure rapid response close to 100 percent of the time, it is generally not cost-effective. Response times here are defined to include four components, which are further illustrated in Figure 2.

Figure 2: Components of Total Response Time



- **Call Handling (Call Processing & Dispatch)** – Time begins when the call taker/dispatcher answers the 911 call and ends when the all units are dispatched. In this instance, Reno EComm, and Sparks dispatch their first responder units, and

²¹ Fractile measurement reports the percentage of calls responded to in x minutes.

transfer the ambulance requests to REMSA. NLTRFD dispatches the first responder and ambulance units.

- **Turnout** – Time elapsed between dispatch to departure from the station (or other location); it comprises activities such as donning protective gear and boarding the apparatus. It is also referred to as out of chute time. In Washoe County, REMSA uses a dynamic deployment model, where ambulances are posted at designated points at designated times of the day depending on current or historical data. They are not assigned to a traditional fixed location.
- **Travel** – Time period begins with departure from the station (or post) and ends when the unit advises that they are on the scene. It does not include the time to actually reach the fire or patient after arrival at the street location of the incident.
- **Vertical** – Time period begins when unit arrives on scene and ends when personnel arrival at the side of the patient or the site of the fire. It may include going up a high-rise (and hence the term vertical response) or traveling within a hospital, shopping mall, golf course, factory, arena, stadium or other expansive site to get to the site of a fire or the side of a patient. By not measuring vertical response times, the EMS system may not accurately measure their actual time it takes to provide care. This often provides inaccurate analysis of EMS efforts.

Recommendation 2: All Emergency Dispatch Centers within Washoe County should begin to collect data on arrival at patient side. They should also collect data on the time that either CPR is started or an AED is deployed.

Most departments do not record the vertical response time component. None of the agencies studied in this report base their performance goals on vertical time, therefore it was not included. Response time is the total amount of time elapsing between an individual calling 911 and emergency service personnel arriving at the scene. Response time can be broken down into multiple segments for analysis (call processing, dispatch, turnout, and travel time). Of these time segments, travel time is the most difficult to improve as it is dependent on the physical location of facilities.

The analysis of response times includes emergency incidents only, with a focus on emergency medical service (EMS) calls for the turnout and travel segments of the response. Since seven different agencies (Reno Fire Department [including TMFPD and various volunteer services], Sparks FD, NLTRFD, SFPD, and REMSA are involved in emergency medical calls in Washoe County, there are different data sets with different results to analyze. In some cases, there were invalid entries (did not have a time recorded) or obvious errors (unit arrived before the call came in) that were excluded from the dataset. Finally, to eliminate outliers that may distort the response statistics, times that were more than three standard deviations from the mean were also excluded. If travel times have a normal distribution, 99.7 percent of incidents are

expected to fall within three standard deviations. The removed 0.3 percent of incidents usually contains errors that can distort the analysis results.

Call Handling – Call handling time includes both call processing (taking down necessary information) and dispatch (notifying the appropriate units). Some CAD systems track each time segment separately but most do not. There are three primary public safety answering points (PSAP) located in Washoe County; including the City of Reno, the City of Sparks, and Incline Village. A secondary PSAP is operated by REMSA. There is some controversy as to how EMS calls are handled by Reno EComm.

- ECOM uses eighteen criteria to determine if a fire first responder unit is necessary based on information gathered during caller interrogation and during call transfer to REMSA dispatch. These eighteen criteria discern if the call should be coded as a priority one/priority two emergency, or a priority three less urgent call.
- If the call is determined to involve a Priority one or two patient, EComm immediately dispatches the closest Reno/Truckee Meadows, or Sierra first responder unit. If the call is in the Truckee Meadows volunteer area, Reno also dual dispatches a career first responder. Simultaneously, Reno EComm notifies REMSA of the emergency call.²²
- In cases where the call is not of an obvious critical nature, a dispatcher will take the call, transfer it to REMSA for dispatch of the transport unit, and then the REMSA dispatcher will notify the appropriate fire protection district to dispatch a fire first responder. This is done via a pager/landline notification system.
- In Sparks, and Incline Village, the call is taken by the 911 operator/dispatcher and the first responder is dispatched simultaneously with the ambulance.
- If the call enters another PSAP, or the initial request is for a different responder (i.e. Law Enforcement) and medical response is later determined, the call gets transferred to REMSA, who after triaging, pages for Priority 1 or 2 response, or directly transfers call, to initiate a response from ECOM.
- If the call enters another PSAP, or the initial request is for a different responder (i.e. Law Enforcement) and medical response is later determined, the call gets transferred to REMSA, who after triaging, pages for Priority 1 or 2 response, or directly transfers call, to initiate a response from ECOM.

Records were not available to measure how often this occurred or the time delay in first responder dispatch.

²² After July 1, 2012, Reno EComm no longer handled dispatch for Truckee Meadows or Sierra.

This section will analyze the call processing and dispatch operations for the four dispatch centers that handle emergency medical dispatch in Washoe County.

It was difficult to determine which agencies were charged with implementing the medical priority dispatch program. Some type of priority dispatch is done by the PSAPs, with a more complete version provided by REMSA, and for NLTFPD, the Sheriff's office. In most cases, the PSAP determines if first responder services are needed and dispatches the appropriate unit. In some cases, REMSA may recode the call and contacts the PSAP for a first responder unit. Records were not provided for us examine the extent of these services.

EComm Call Handling: The City of Reno Emergency Communications Center (EComm) handles dispatch for Reno, Truckee Meadows, and Sierra. It also provides dispatch for the volunteer fire departments in Washoe County.

For CY10 and CY011, call processing and dispatch times for EComm for all EMS calls averaged 01:34 with a 90th percentile time of 3:06. This is above the NFPA recommendation (NFPA 1221) of 1 minute for call processing. When filtered to analyze only the first unit dispatched, total dispatch time drops to 02:17 at the 90th percentile. This is still 01:15 over the NFPA goal. The remaining time likely involves the transfer between EComm and REMSA.

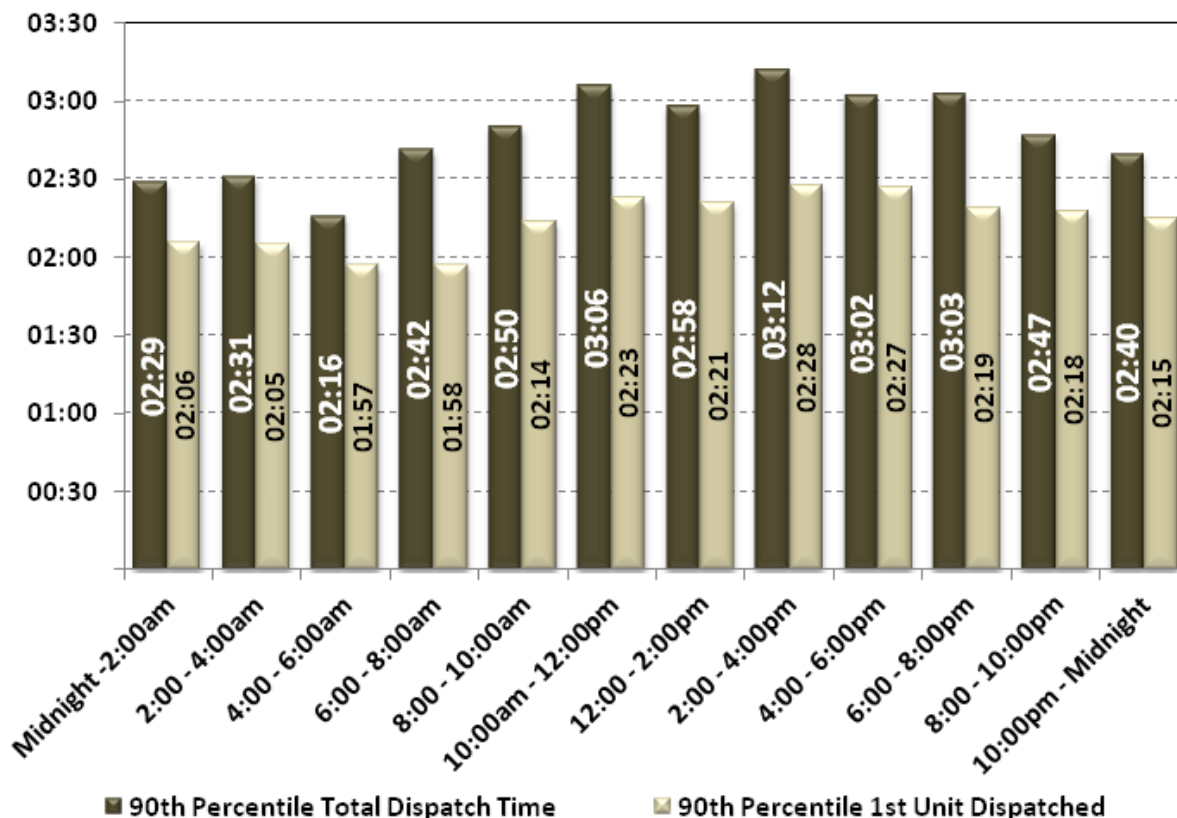
EComm's CAD system does capture both the call processing and dispatch segments of the overall call handling process. All EMS calls, regardless of location and responders (career vs. volunteer) should be handled in the same manner. For CY10 and CY11, EComm completed the call processing segment (call received to call entry) in 01:41 for career departments and 01:52 for volunteer departments, 90 percent of the time.

Unlike call processing, the dispatch process (locating and notifying the appropriate units) will differ between career and volunteer departments. Volunteers make up less than 1/10th of the total dispatch volume (CY10 and CY11). Regardless of whether a volunteer unit is closer, they are not the first notified in the call sequence. Our visit to EComm showed that this appears to be a technological issue that leads to dispatch delays. For CY10 and CY11, EComm completed the dispatch segment in 01:23 for career departments and 05:05 for volunteer departments, for 90 percent of the EMS calls.

Recommendation 3: Reno EComm (and successor organizations) and the Departments with volunteer fire services should develop a technological solution to decrease the impact of dispatch delays.

Some variation can be expected by time of day to correspond with heavier or lighter call volumes. Figure 3 depicts the variation in 90th percentile total dispatch time by time of day for EMS calls for all units and for the 1st unit dispatched. Total dispatch times for EMS calls ranged from a low of 01:57 between 4 a.m. and 6 a.m. to a high of 02:28 between 2 p.m. and 4 p.m. for the first unit dispatched. Total dispatch times for these time segments are proportional to the call volume during that period.

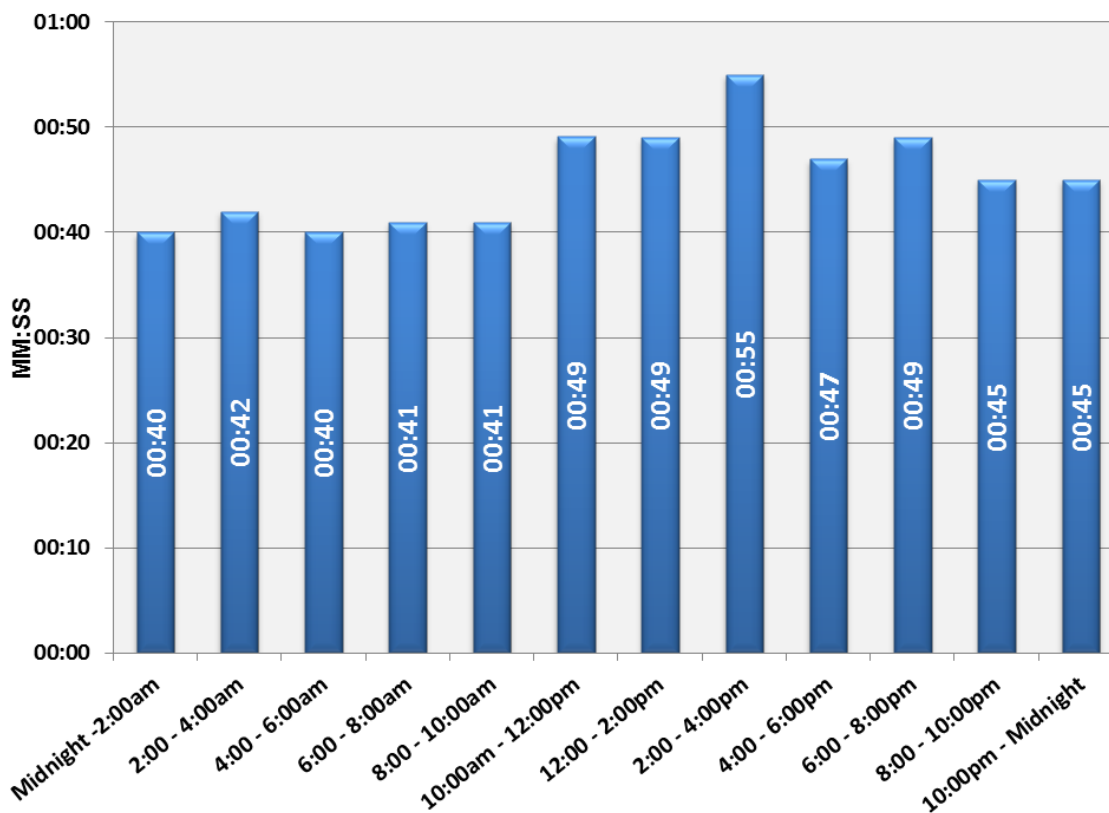
**Figure 3: 90th Percentile Total Dispatch Times (EMS Calls)
for All Units and 1st Unit Dispatched by EComm, CY10 and CY11**



Sparks Call Handling: From October 2009–September 2011, call processing and dispatch times for Sparks Fire Department averaged 00:20, with a 90th percentile time of 00:47. This achieves the NFPA recommendation of 1 minute for call processing.

Some variation can be expected by time of day to correspond with heavier or lighter call volumes. Figure 4 depicts the variation in 90th percentile call processing time by time of day for EMS calls. Call processing times for EMS calls ranged from a low of 00:40 between midnight and 2 a.m. and again from 4 a.m. and 6 a.m. to a high of 00:55 approximately twelve hours later between 2 p.m. and 4 p.m. Dispatch operations at Sparks should be commended for their excellent work of staying below the NFPA recommendation of 1 minute and getting call information and notifying emergency units in 00:47, 90 percent of the time.

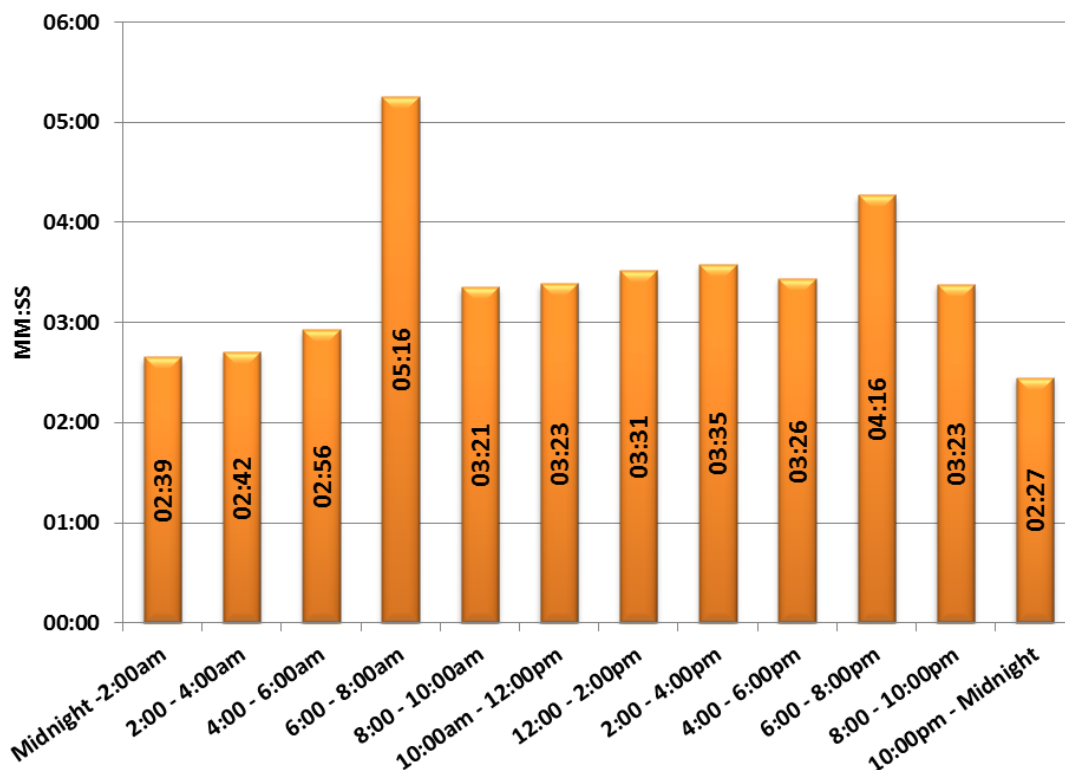
**Figure 4: 90th Percentile Call Processing Times (EMS Calls)
by Sparks Dispatch, October 2009–September 2011**



Washoe County Sherriff's Office Call Handling for NLTFPD: For CY09 and CY10, call processing and dispatch times for WCSO averaged 02:11 with a 90th percentile time of 03:24. This is two minutes over the NFPA recommendation of 1 minute for call processing.

Some variation can be expected by time of day to correspond with heavier or lighter call volumes. Figure 5 depicts the variation in 90th percentile call processing time by time of day for EMS calls. Call processing times for EMS calls ranged from a low of 02:27 between 10 p.m. and midnight to a high of 05:16 between 6 a.m. and 8 a.m. Dispatch times remain relatively flat around the 3:00 minute mark except for 6 a.m. and 8 a.m. (05:16) and 6 p.m. and 8 p.m. (04:16) despite less than an average of 1 call per day per these time periods (.19 and .40 calls, respectively). WCSO and NLTFPD should look at the dispatch process to identify opportunities to improve overall dispatch time, with a focus on 6 o'clock to 8 o'clock in the morning and evening.

Figure 5: 90th Percentile Call Processing Times (EMS Calls) by WCSO Dispatch, CY09 and CY10



Update from Washoe County Sheriff's Office: Just prior to publication of the final draft, we received updated data from Washoe County that documented call processing times. Between September 24, 2011 and May 25, 2012, WCSO dispatch processed 41 Priority One and Two EMS calls for North Lake Tahoe FPD. Overall, the improvement in processing of high-priority EMS calls is commendable. .

Table 9 describes the newly analyzed data.

Table 9: Updated WCSO Dispatch Data, 2011-2012

Measure	Result
Mean (911 Answer to Dispatch)	38 Seconds
Standard Deviation (911 Answer to Dispatch)	24 Seconds
90 th Percentile (911 Answer to Dispatch)	57 Seconds

After receiving update information for 2012, we attempted to determine what changes were made to improve processing of EMS calls. We were advised that in 2012, the WCSO realigned dispatch policies that combined rapid pre-alerting with use of the MPDS Pro-QA software. The calls were immediately dispatched, and the responding units were updated with

additional information.²³ This change has resulted in a significant reduction in high-priority EMS dispatch times. The data should be reexamined after a complete year of implementation.

REMSA Call Handling: In most cases, REMSA acts as a dispatch point, receiving emergency calls from one of the area PSAPs. Occasionally, REMSA receives an emergency call directly from, usually from a medical facility. REMSA does not mark a separate time for dispatch. The first time stamp is marked when the call is received and the second is when the dispatched unit marks en route. The combined dispatch and turnout time will be discussed in the turnout section.

Turnout Time – Turnout time is measured from when the alarm is received by operations personnel to when the apparatus begins driving to the incident scene. Travel or drive time is the time it takes to go from the ambulance post, or current location, to the emergency incident. Together these segments represent the response time. National standards, such as NFPA 1710, suggest a response time of five minutes: one minute for turnout and four minutes for travel time for initial response. In urban and rural areas, CAAS standards call for a transport unit to be on scene within 8 minutes and 59 seconds, 90% of the time. For the purposes of this study, these segments will be analyzed individually since that is how they are recorded.

REMSA is required to respond to all MPD Level D and E (Priority One) calls in under eight minutes and 59 seconds, 90% of the time, in the urban areas. Time requirement for suburban areas is 15 minutes, 20 minutes in rural areas, and *best effort* in wilderness areas. There are no contractual time requirements for MPD Level A, B, C, or Omega calls (Priority Two or Three).

Turnout times should be reviewed cautiously. Quick response to high priority calls should be expected. Responders should not be expected take any unsafe actions just to beat the clock. Also, when the responder indicates that the unit is en route is subject to interpretation. There is a difference when you measure the end of turnout time when someone calls in on a portable radio, or when the call is made after the crew is seated in the unit.

There are other variables that influence turnout times including:

- Emphasis on personnel safety and not moving the apparatus until all protective gear is donned and all personnel are in seat belts.
- Although the time starts when units are dispatched to a call, there is currently no consistent method of when this time segment ends.
- A delay in time stamping by the PSAP – time stamping is done manually by dispatchers after acknowledgement of en route radio traffic from the fire units. Delays in time stamping may be small or large, but all calls have some degree of delay. An additional

²³ WCSO. (2012). Inline Communications Center Policy: Pre-Alert/Dispatch.

factor in this delay may be caused by fewer dispatchers and the increased work load the remaining dispatchers are faced with.²⁴

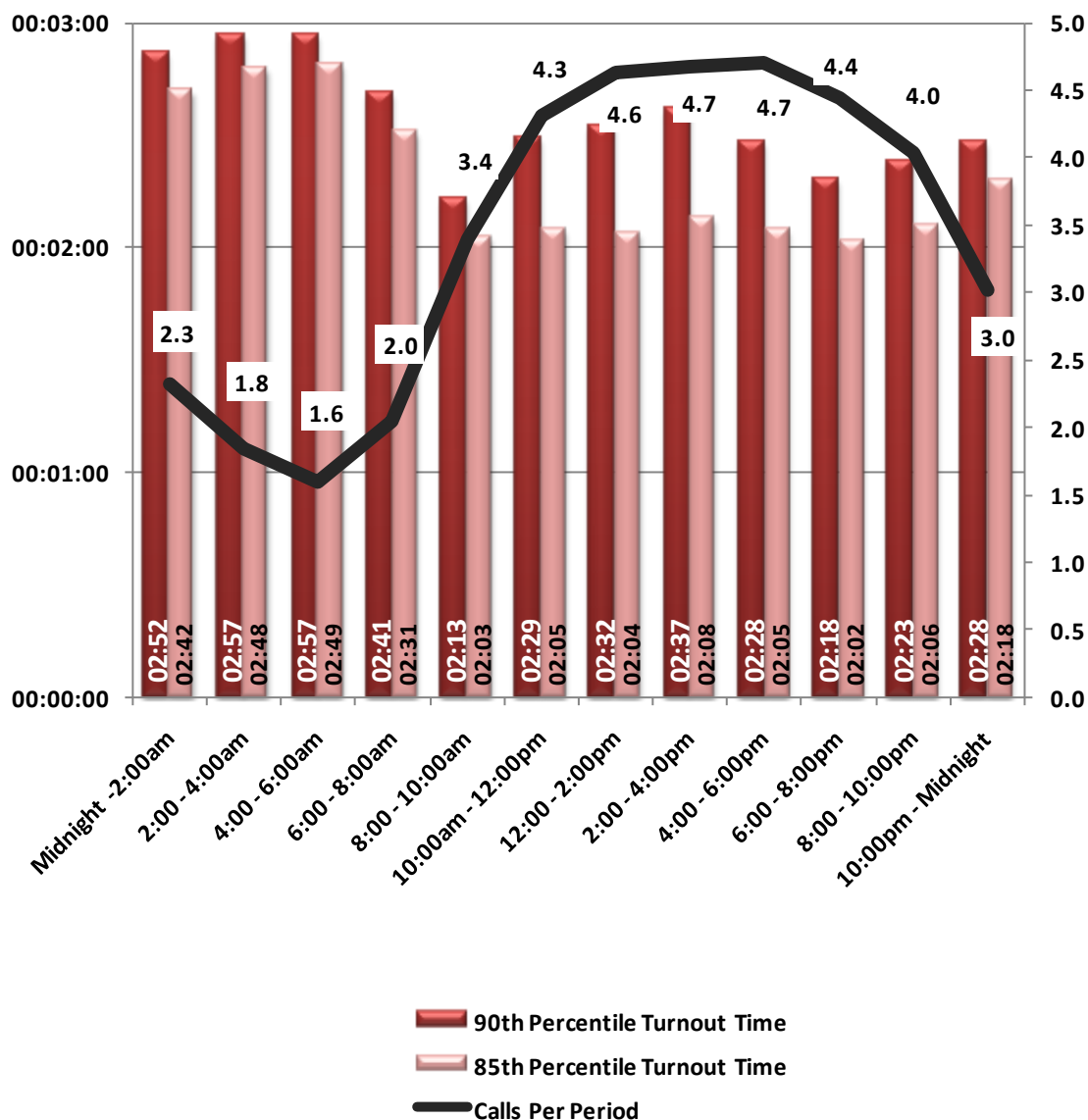
- Extended protective clothing donning times due to more complex protective clothing and related fastening systems.
- Extended mobilization times due to more complex specialized equipment and vehicles.
- The NFPA standards themselves may be too restrictive given the current fire clothing and specialized equipment technology.
- The call's "sense of urgency" may be incorrectly evaluated by responding units based on initial dispatch information. Also, including non-emergency responses could skew the results.
- Extended route planning time due to non-grid street arrangements in newer areas of the each city.
- Extended mobilization times when calls occur during training sessions.

Reno Turnout: The average turnout time for EMS calls for Reno and TMFPD units in CY10 and CY11 was 01:36, with a 90th percentile time of 02:39. Although, Reno does not use the NFPA 1710 recommendation, their current goals do not include turnout (just overall call to unit on scene measure). The NFPA recommendation of 01:00 minute, 90 percent of the time, provides a good benchmark.

Figure 6 shows both the 90th and 85th percentile turnout times and average number of calls for EMS incidents responded to by Reno Fire units by time of day. Similar to Sparks, call volume decreases during the night and early morning, while turnout time increases. Even reducing to the 85th percentile, turnout times are 01:00 minute higher than recommendations.

²⁴ This factor can influence all time interval accuracy.

Figure 6: 90th and 85th Percentile Turnout Times and Average Call Volume by Time of Day for Reno Fire Department, CY10 and CY11

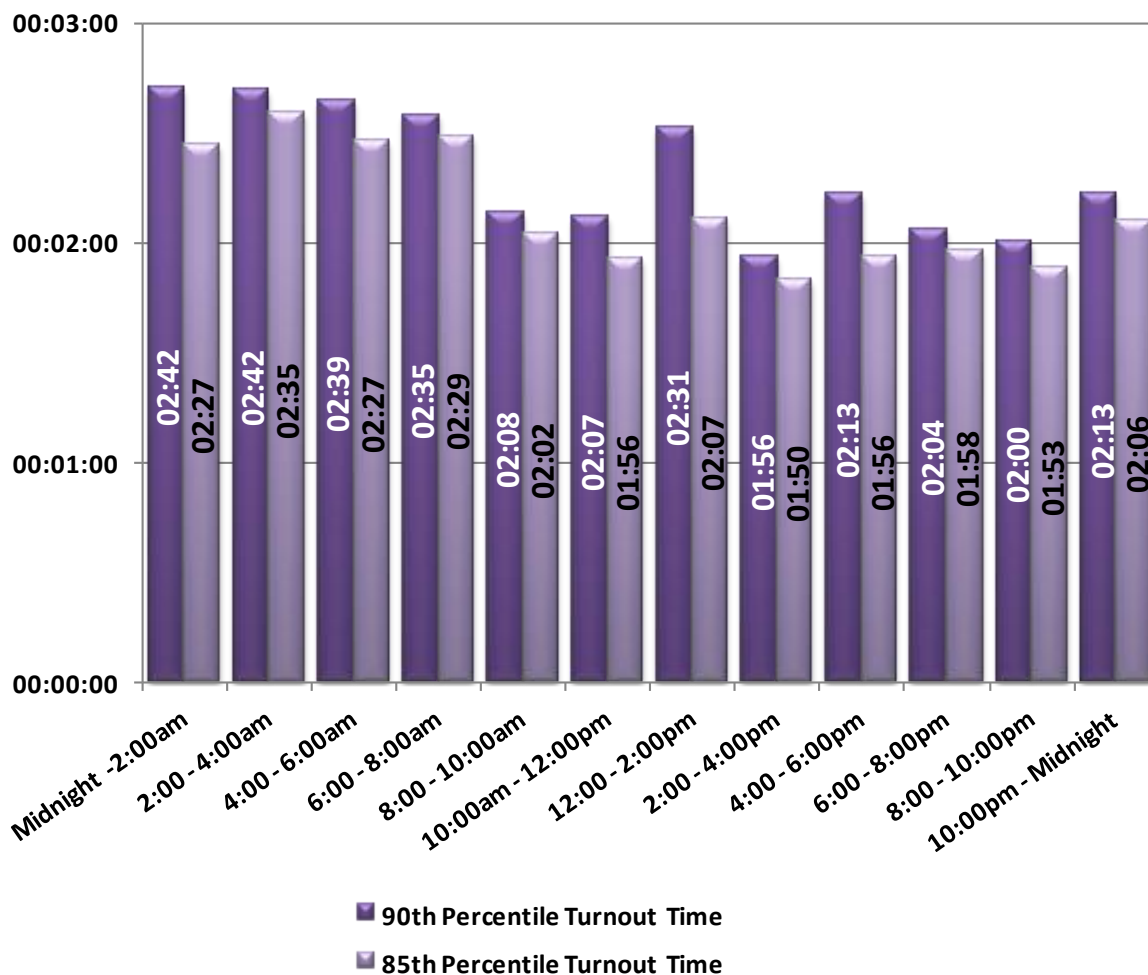


SFPD Turnout: The average turnout time for EMS calls for SFPD units in CY10 and CY11 was 01:27, with a 90th percentile time of 02:21. Similar to Reno, Sierra does not use the NFPA 1710 recommendation, they use an overall response time and measure at the 85th percentile. Since career staff are in station or in their apparatus during their shift, and should not need to don PPE beyond gloves for EMS calls, the NFPA recommendation of 01:00 minute, 90 percent of the time, should be the goal of all career departments in Washoe County.

Figure 7 shows both the 90th and 85th percentile turnout times for medical calls for Sierra by time of day. The pattern is similar to Reno, with a much lower call volume (averaging less than 1 call per 2 hour time segment during the study period of CY10 and CY11) and less contrast

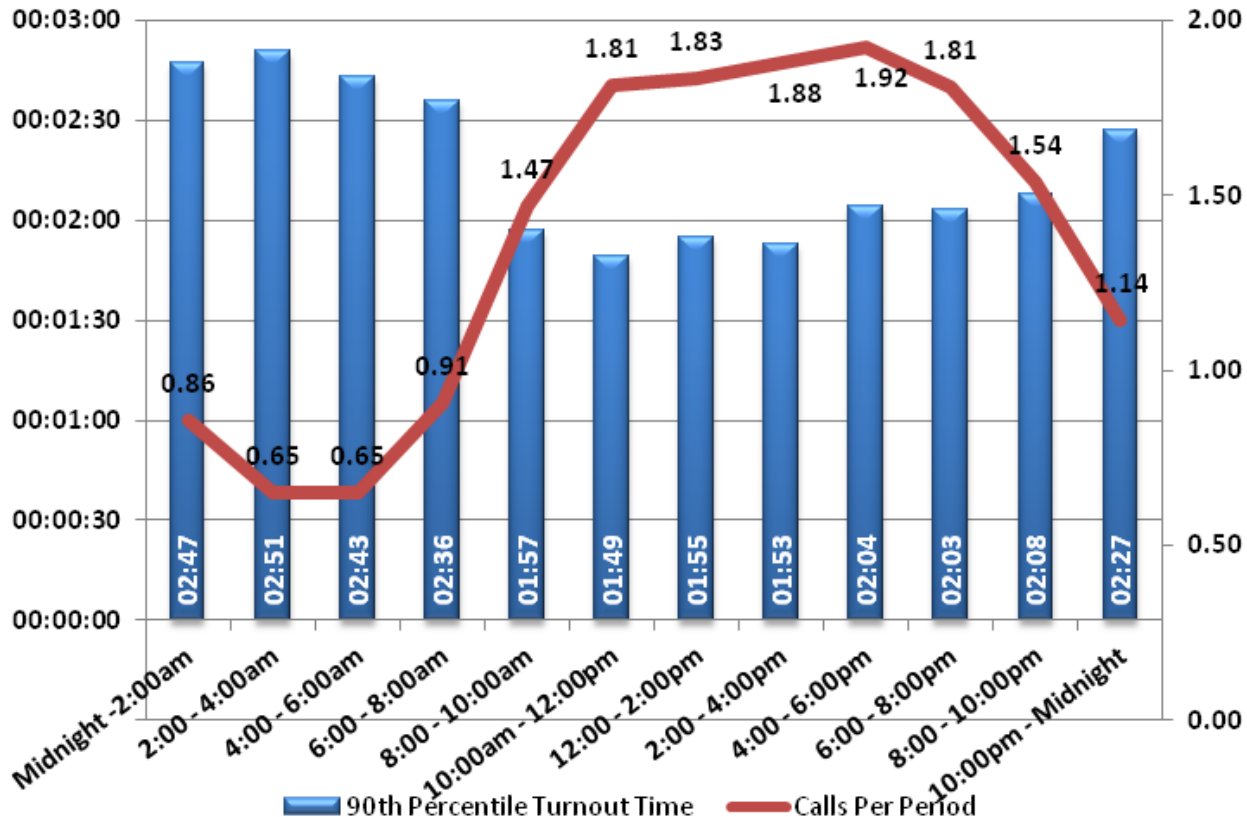
between the 90th and 85th percentile levels, Again, at the 85th percentile, times hover around the 02:00 minute mark during their best performance.

Figure 7: 90th and 85th Percentile Turnout Times by Time of Day for SFPD, CY10 and CY11



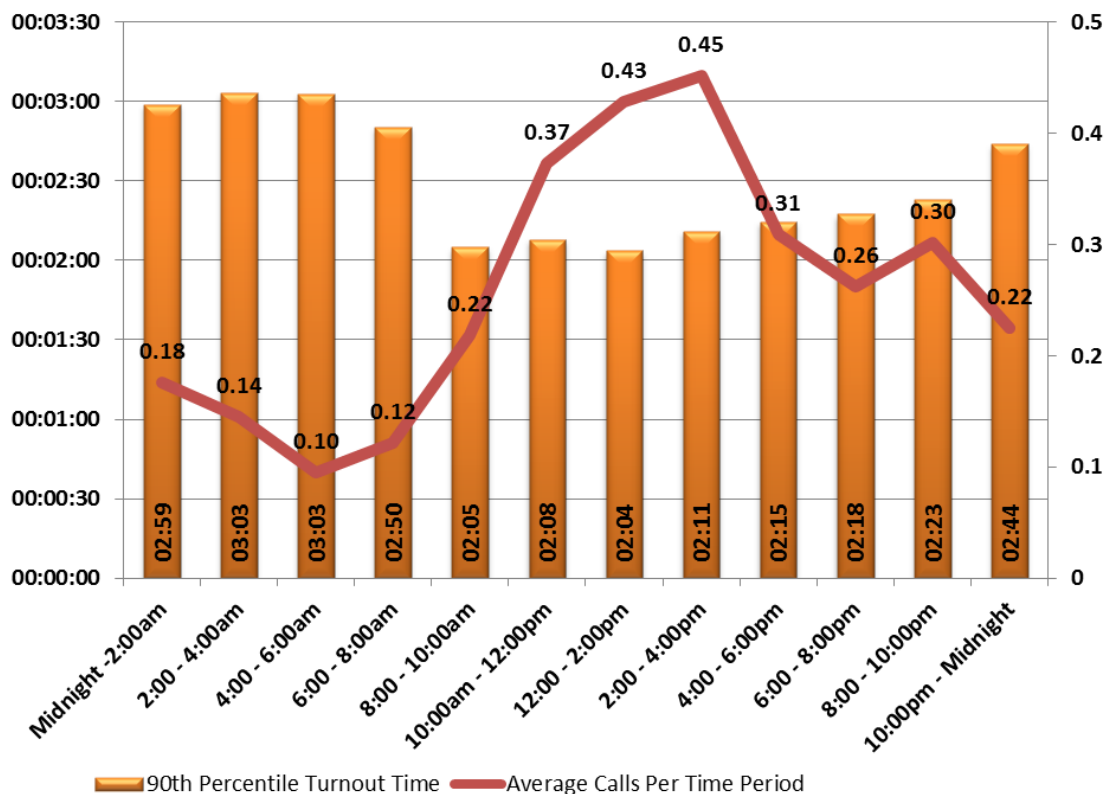
Sparks Turnout: The average turnout time for SFD EMS calls, between October 2009 and September 2011, was 01:31, with a 90th percentile time of 02:20. This is 01:20 higher than the recommended time of 1 minute. Like call processing, turnout times can vary with the time of day. Figure 8 shows the 90th percentile turnout times and average number of calls for EMS incidents in Sparks by time of day. Unlike call processing, call volume decreases during the night, but turnout time increases because responders are often sleeping. Turnout times at their best are higher than the NFPA recommended turnout time of 1 minute. Sparks Fire Department should review policies and procedures to see if there any means of reducing turnout times.

Figure 8: 90th Percentile Turnout Times and Average Call Volume by Time of Day for Sparks Medical Calls, October 2009–September 2011



NLTFPD Turnout: The average turnout time for EMS calls in NLTFPD for CY09 and CY10 was 01:30, with a 90th percentile time of 02:34, which is 01:34 higher than the recommended time of 1 minute. Figure 9 shows the 90th percentile turnout times and average number of calls for EMS incidents in the NLTFPD by time of day. Unlike call processing, call volume decreases. Turnout times at their best are almost double the recommended turnout time of 1 minute.

Figure 9: 90th Percentile Turnout Times and Average Call Volume by Time of Day for NLTFPD Medical Calls, CY09 and CY10



REMSA Turnout: REMSA turnout time includes both dispatch and turnout. Based on NFPA 1710 recommendations, the goal for this time segment for REMSA would be 01:30 (30 seconds for dispatch and 1 minute for turnout). The average turnout time for REMSA calls for CY09 and CY10 was 01:27, with a 90th percentile time of 02:39. When looking at just Priority 1 (life-threatening) calls, turnout times were reduced to 02:11 at the 90th percentile. Although REMSA does not follow NFPA 1710, because of their system status management and lack of PPE to don, they should have times closer to the recommended goal of 01:30 minute. Figure 10 shows the 90th percentile turnout times for all calls, Priority 1 calls and the average number of calls REMSA units responded to during the time period for CY09 and CY10. Turnout times and call volume decrease overnight, however, even at their lowest for life threatening calls, they are 00:20 over the time recommended for emergency medical response (01:30).

Figure 10: 90th Percentile Turnout Times for All Calls and Priority 1 Calls and Average Call Volume by Time of Day for REMSA Calls, CY09 and CY10

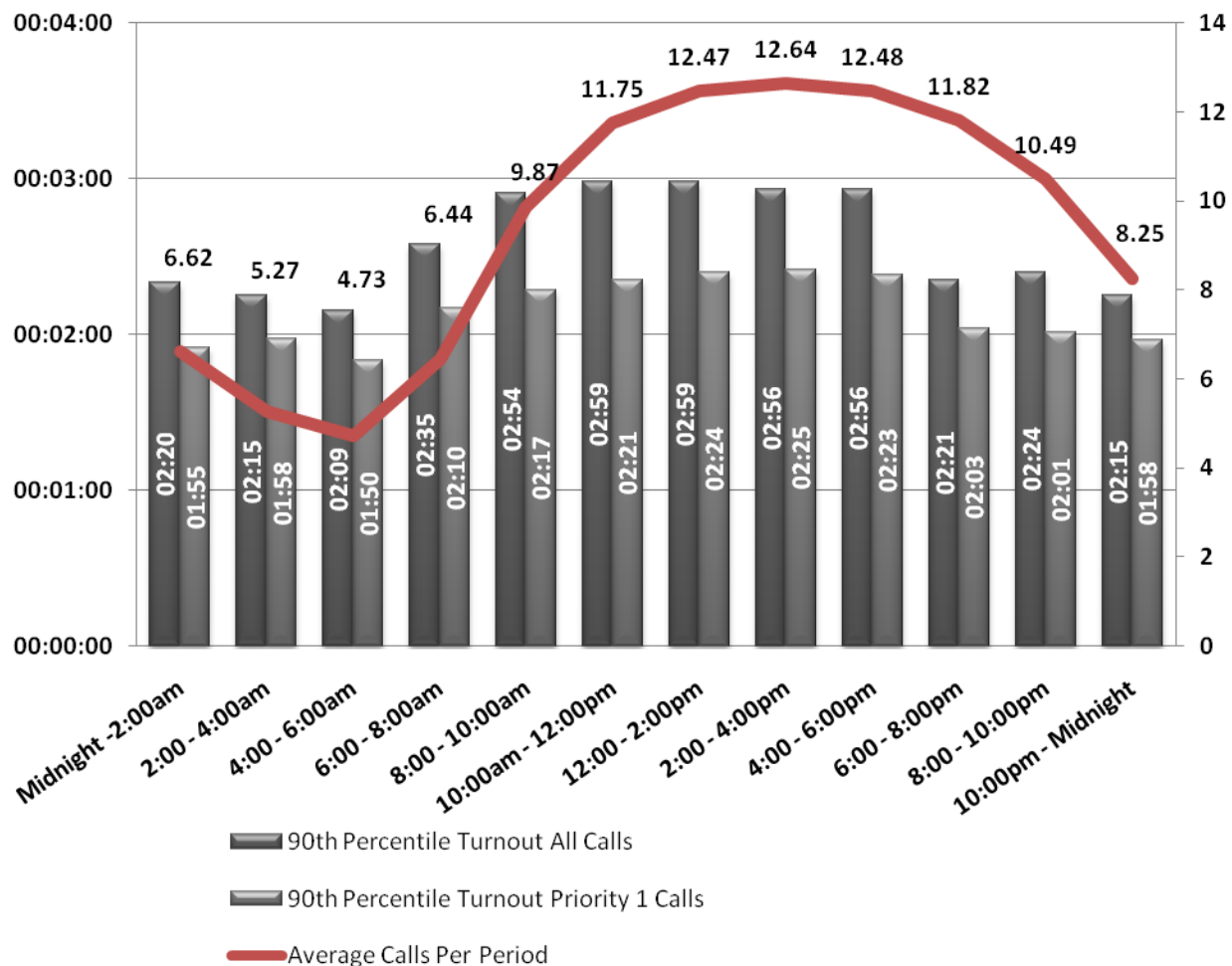


Table 10 summarizes the 90th percentile for EMS turnout times for each department.

Table 10: Summary of 90th Percentile for EMS Turnout

EMS Agency	Time
Reno Fire Department	2:39
Sparks Fire Department	2:20
North Lake Tahoe Fire Protection District	2:34
Sierra Fire Protection District	2:21
REMSA	2:39 (2:11 for Priority 1 calls)

Turnout times must be viewed with caution. When the unit notifies dispatch it is responding, it can be anywhere in the process. We cannot be sure if the first person to the radio calls out, or if everyone is seated in the vehicle. With the current emphasis on provider safety and risk management, some fire and EMS organizations now require that providers have their

basic PPE donned, are seated, and their seat belts fastened before the vehicle moves. The officer and emergency vehicle driver must confirm this prior to commencing response. While this may slightly lengthen turnout time, it is a worthwhile safety investment.²⁵

Travel Time – Travel (drive) time is measured from the station, or wherever the unit is, to the emergency incident. Station and apparatus placement has the biggest impact on travel time, (though apparatus are not always in the station when dispatched.) Additional factors influencing travel time include traffic, weather, traffic limiting devices (stop lights, speed bumps, etc.), and driver familiarity with the area. Traffic congestion and weather are beyond the department and city's control; however, traffic limiting devices and driver knowledge are not. REMSA units respond from pre-designated posts that often change based on demand.

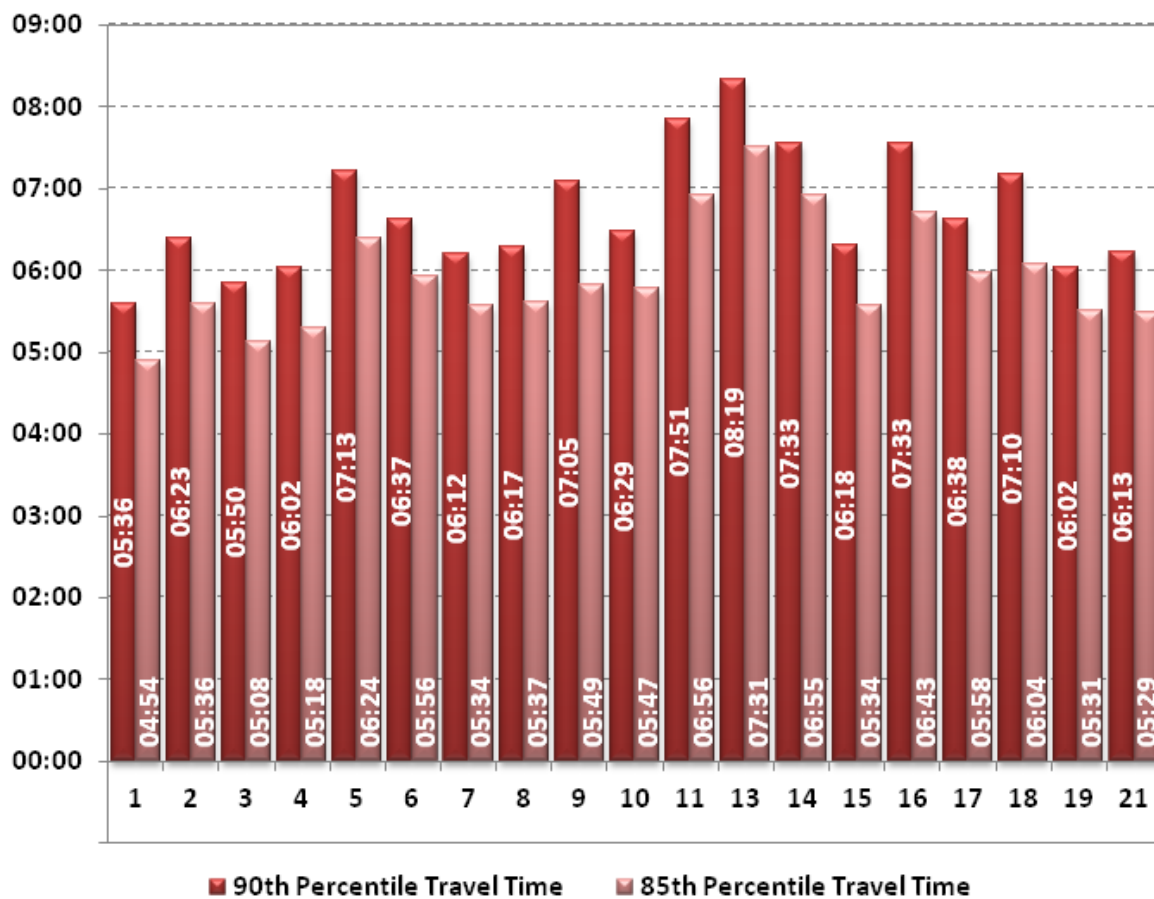
One key to the analysis of travel and total times is to determine the order of arrival. NFPA 1710 response time recommendations are based on the first arriving unit. REMSA's CAD (computer-aided dispatch) system does not synchronize or relate to the other emergency response agencies it partners with by unique identification (incident number). Due to this it is difficult to fully analyze medical response in Washoe County because the chronology of the call cannot be easily pieced together for each call. The time for the first unit to arrive on scene will be the department's first unit and not the incident's. Because of the response relationship between REMSA and several Fire Departments in Washoe County, they should look at implementing a system or process for reconciling incidents by a unique identifier.

Recommendation 4: Review the incident reporting procedures between REMSA and all Fire Protection Districts and implement a unique identifier that allows for the reporting, integration, and analysis of an entire incident and not just the respective department's performance.

Reno Travel: The average travel time for Reno units was 03:43, with a 90th percentile of 06:28 and an 85th percentile of 5:41. Figure 11 shows the 90th and 85th percentile travel times by station for EMS calls in CY10 and CY11. The NFPA recommends a travel time of 04:00 for the first unit to arrive and based on the location of the incident, Reno has a goal of either 6 or 8 minutes (total response time). There are several factors that can increase travel time, such as speed limits, traffic, access to calls, and location of calls. The location of incidents and their effect on travel times are discussed later in this chapter.

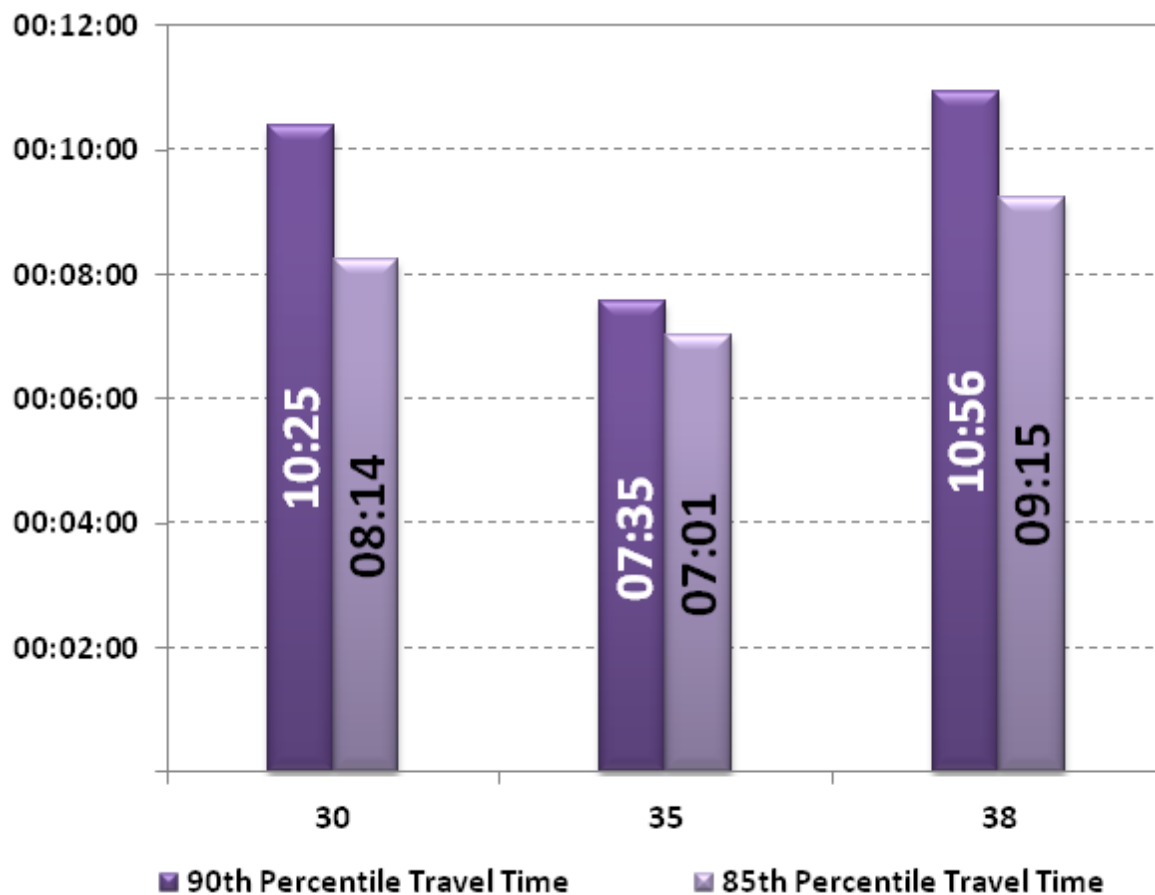
²⁵ We are unable to determine if the NFPA or CAAS has considered this change in determining the goal for turnout or "out of chute" time.

Figure 11: 90th and 85th Percentile Travel Times by Reno Stations for EMS Calls, CY10 and CY11



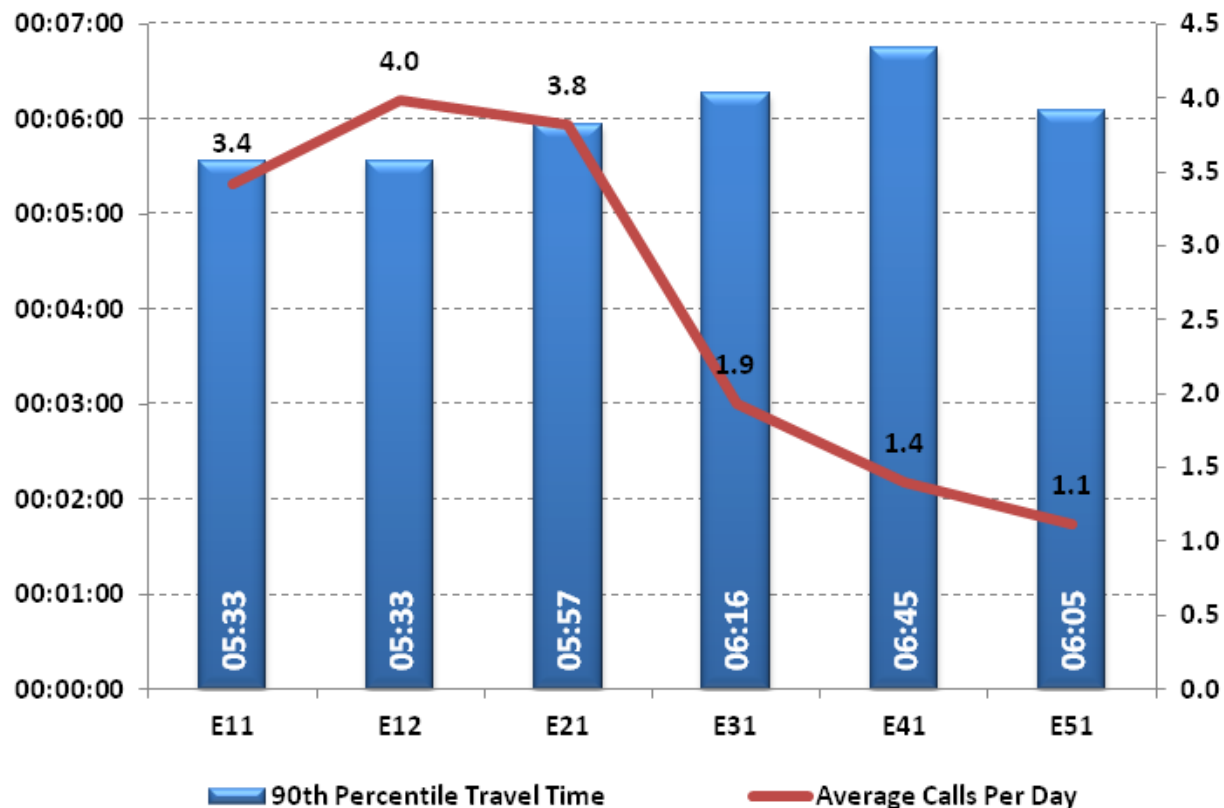
SFPD Travel: The average travel time for SFPD units for CY10 and CY11 was 05:04, with a 90th percentile of 09:02 and an 85th percentile of 07:55. Figure 12 shows the 90th and 85th percentile travel times by station for EMS calls in CY10 and CY11.

Figure 12: 90th and 85th Percentile Travel Times by SFPD Stations for EMS Calls, CY10 and CY11



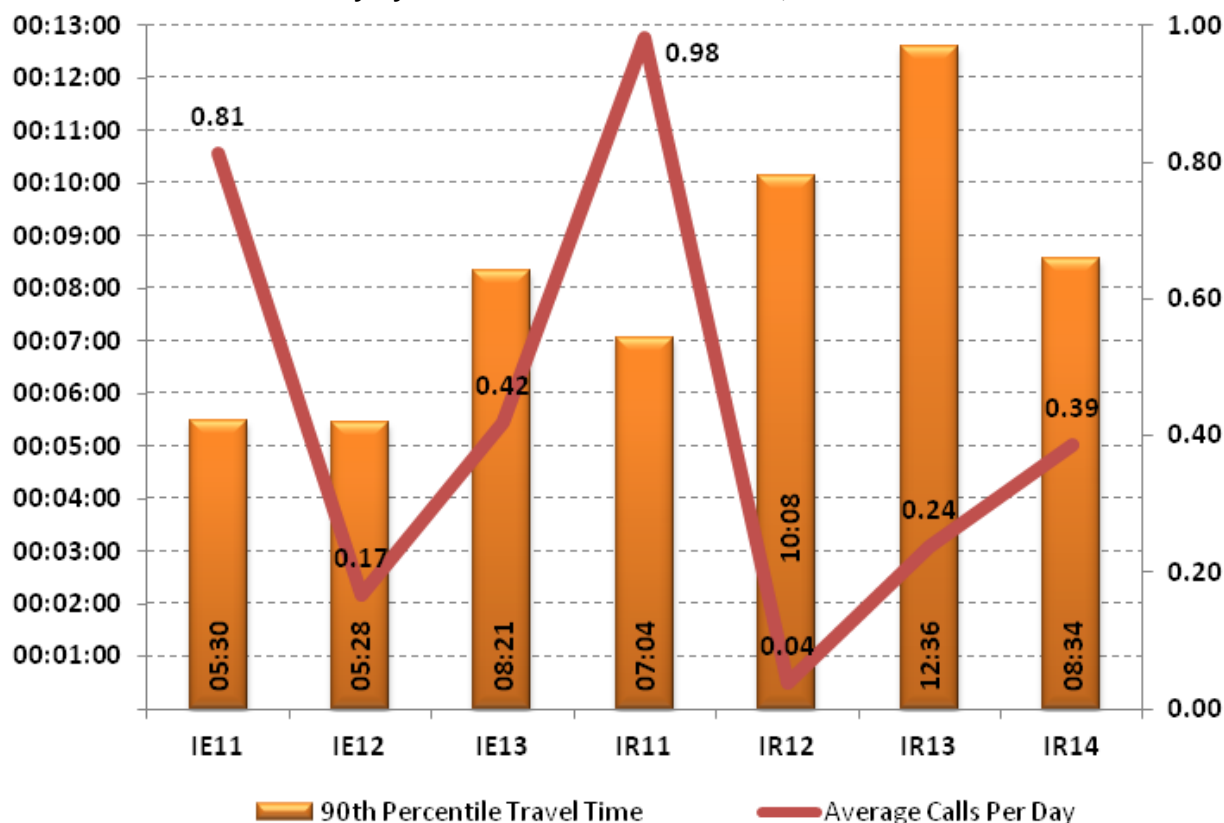
Sparks Travel: The average travel time for Sparks Fire Department units was 03:42, with a 90th percentile time of 5:57. Figure 13 shows the 90th percentile travel times for the first arriving Sparks unit on EMS incidents with a minimum of 200 calls from October 2009 through September 2012. The NFPA recommends a travel time of 04:00 for the first unit to arrive. There are several factors that can increase travel time, such as speed limits, traffic, access to calls, and location of calls. The location of incidents and their effect on travel times are discussed later in this chapter.

Figure 13: 90th Percentile Travel Times and Average Calls per Day by First Arriving Sparks Unit for EMS Calls, October 2009-September 2011



NLTFPD Travel: The average travel time for NLTFPD units on EMS calls was 03:50, with a 90th percentile of 7:30. Figure 14 shows the 90th percentile travel times for the primary EMS response units for CY09 and CY10. The NFPA recommends a travel time of 04:00 for the first unit to arrive.

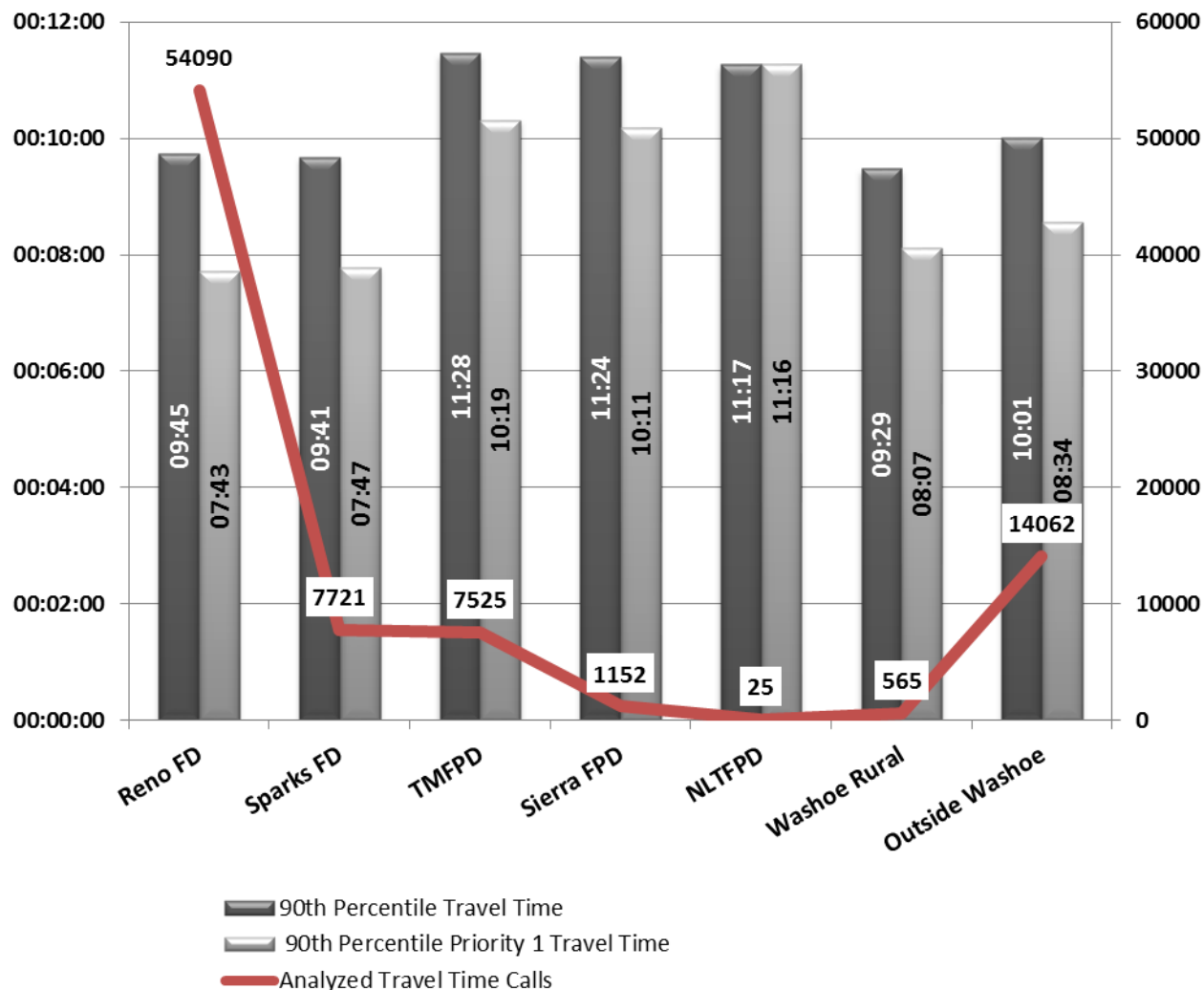
Figure 14: 90th Percentile Travel Times and Average Calls Per Day
Per Day by NLTFPD Units For EMS Calls, CY09 and CY10



Travel times are not generally affected by weekday, but there is an increase in travel time during the winter and spring months (December–April) when there is winter weather and increased activity at the Mt. Rose Ski Resort. There are a number of factors that play into these response times including station location, proximity to incidents, and call volumes. It should be noted that responding units in NLTFPD are not always in the station when dispatched. Furthermore, units often respond outside of their first-due area when closer units are unavailable, which also increases travel times.

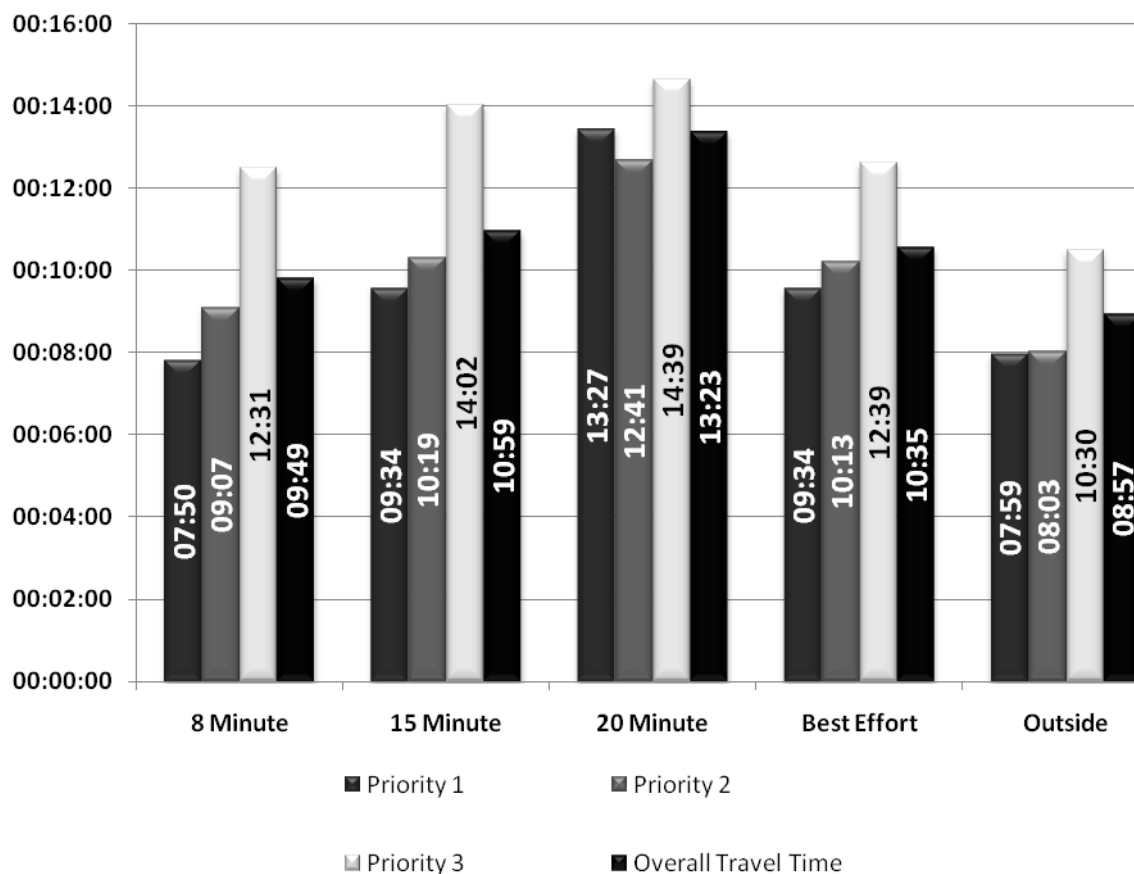
REMSA Travel: The average travel time for REMSA units on EMS calls was 03:50, with a 90th percentile of 7:30. Since REMSA responds at different levels and to locations all over Washoe County, it is important to look at their travel times for the areas they serve and the response goals they have set. Figure 15 shows the 90th percentile travel times for all calls and Priority 1 calls by fire protection district in CY09 and CY10.

Figure 15: 90th Percentile Travel Time for All Calls and Priority 1 Calls by City or Fire Protection District, CY09 and CY10



Travel times are lowest in the urban core of Washoe County and increase as they move into suburban and rural areas. For CY09 and CY10, the majority of responses (63%) were in Reno, which had the lowest travel times. However, Sparks and TMFPD had relatively the same call volume (roughly 7,500 calls) but a difference of almost 2 minutes for all calls and almost 2.5 minutes for Priority 1 calls. All of the TMFPD stations are located in suburban areas. Figure 16 shows the 90th percentile travel times for all calls and Priority 1 calls by response goal area.

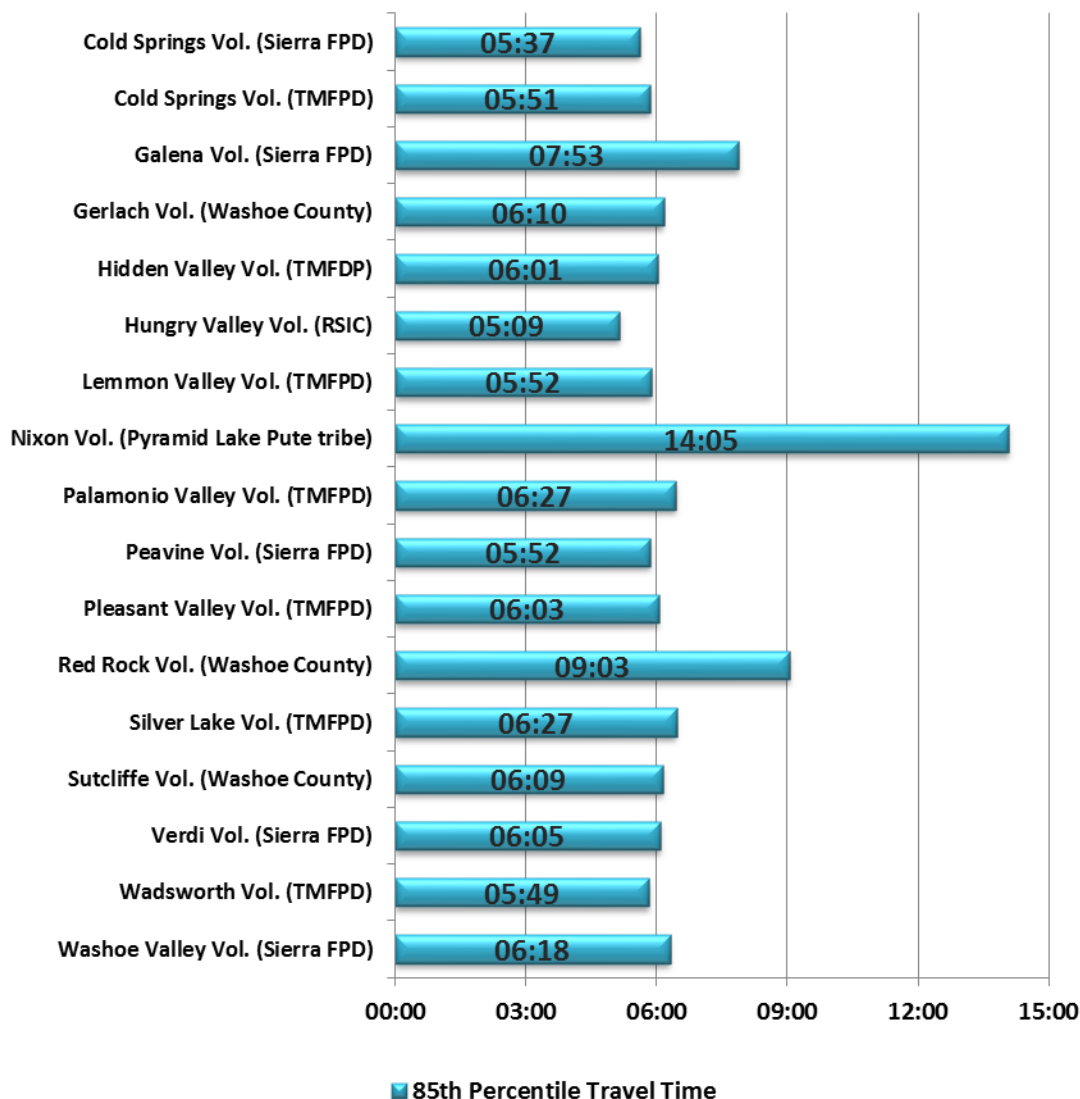
Figure 16: 90th Percentile Travel Times by Priority for REMSA Response Areas, CY09 and CY10



At the Priority 1 level (which the response goals were developed for), REMSA is under for all three timed goals (8, 15, and 20 minutes) for travel. However, this is just the travel component and in the 8 minute response area, there is only a buffer of 10 seconds for the dispatch and turnout portions of the response.

Washoe County Volunteers: Due to the varied geography and infrastructure of the response areas, it is difficult to paint a general picture of the volunteer response system in Washoe County. Figure 17 shows the 85th percentile travel time for each of the Volunteer Fire Departments in Washoe County. Most have relatively low travel times, but are located in suburban/rural areas. There calls tend to be concentrated in specific areas, but there are incidents with extended response times. Nixon VFD is a tribal-based department (which receives funding and support from the Washoe County) has the highest travel time, but also has one of the larger response areas, and is located in a rural setting. Gerlach is the only volunteer department that provides transport (they drive until they meet a REMSA unit for transfer). In CY10 and CY11, Gerlach responded to 317 medical calls. Volunteer station locations are found in Figure 46.

Figure 17: 85th Percentile Travel Times by Volunteer Fire Department for EMS Calls, CY10 and CY11



Total Response Time – For mathematical reasons, one cannot simply add the percentile time segments together to reach the total 90th or 85th percentile response time. This segment looks at the total time from when the call is received by the PSAP (or in REMSA’s case, when they are notified by the PSAP) until the 1st unit from that department arrives.

Reno Total: Reno’s performance goals are based on the location of the incident and start from the time they receive the dispatch. This study looked at both the Reno goals (time segments for which they are responsible for) and the total response time, since the public will not often recognize the difference between the PSAP and the responding agency. Reno performance goals specify that in the urban area, the first arriving unit on a medical call should arrive within 6 minutes from time of dispatch and within 8 minutes for calls in the suburban zone, 85 percent of

the time. Table 11 shows the 85th percentile response time for the first arriving unit on medical calls for CY10 and CY11 and how they compare to the Reno performance goals.

Table 11: 85th Percentile Response Time (Dispatch to Arrival) for the 1st Arriving Unit on Medical Calls in the Reno Performance Zones

Performance Zone	Reno Goal	CY10-CY11 Actual
Urban	06:00	06:01
Suburban	08:00	08:30

For CY10 and CY11, Reno Fire averaged a total response time (call received to first unit on scene) of 06:18, with an 85th percentile time of 08:33, for the first arriving unit on a medical call for all performance zones. Overall, Reno Fire is performing very close to their performance goals.

SFPD Total: SFPD, along with the TMFPD, and the Washoe County Commission adopted goals recommended from the Washoe County Master Plan, Planning Area Goals Minimum Service Standards. These goals are based on planning area designations, measure from the time the call is received at the PSAP until the first unit arrives, and do not allow for a fractal response time. Based on these performance goals, all calls should be reached within the minimum standard. For CY10 and CY11, SFPD average a total response time of 09:05 for the first arriving unit. Table 12 shows the SFPD performance goals by zone and their total response time (100 percent and 85 percent) for the first arriving unit on medical calls.

Table 12: SFPD Total Response Time by Performance Zone (100 and 85th Percentile), CY10 and CY11 vs. Recommended Total Response

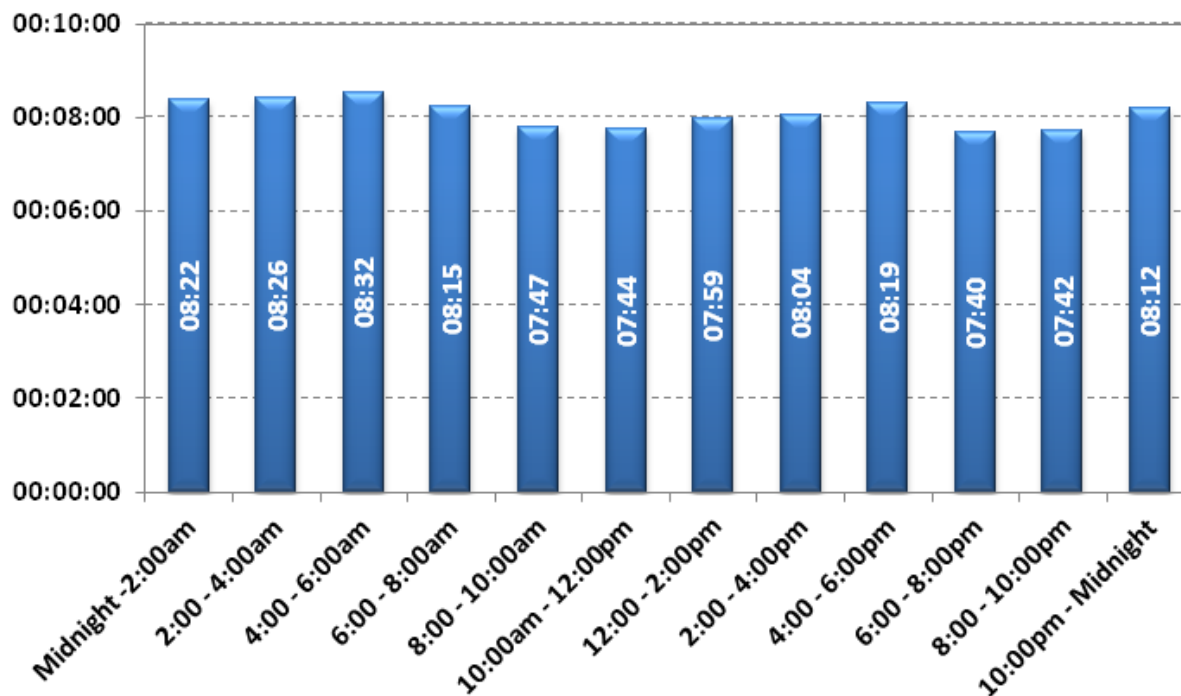
Performance Zone	Response Goal	100 Percent	85 Percent
Urban	N/A	N/A	N/A
Suburban	10:00	1:03:04	10:22
Rural	20:00	18:04	13:24

As shown in Table 12, the minimum service standard (100 percent goal) can be distorted by a few exceptions to a response system that handles most (85th percentile) of the calls near or below the goal. SFPD should look at revising their performance standard to include a fractile that will remove these exceptions from their dataset. These exceptions can be caused by weather, change in apparatus status or availability or other unforeseen circumstances.

Sparks Total: For October 2009-September 2011, total response times for Sparks Fire Department averaged 05:37 with a 90th percentile time of 08:03. Calls for emergency medical services (EMS) make up the majority (76%) of Sparks Fire Department responses. From October of 2009 through September of 2011, Sparks Fire Department responded to 12,254 EMS calls out of the total incident volume of 16,174 calls. Total response times (8:03 at the 90th percentile for the first arriving unit) are more than two minutes higher than the recommended time of 6 minutes

for EMS calls. Figure 18 shows the 90th percentile total response time for the first arriving Sparks unit on EMS calls by time of day.

Figure 18: Sparks 90th Percentile Total Times By Time of Day on EMS Calls, October 2009–September 2011

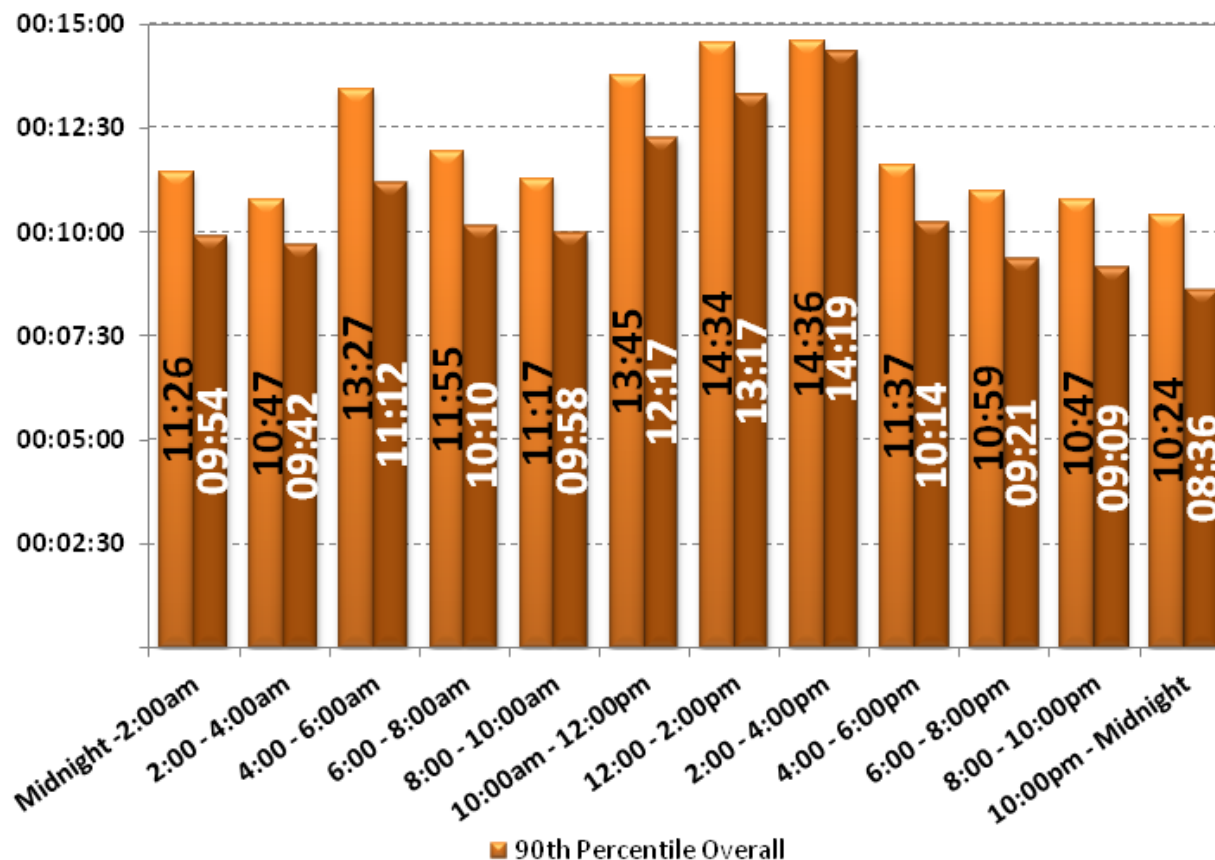


The department should continue to take steps to reduce overall response times and improve 90th percentile compliance. The department is doing very well in the dispatch portion and should continue with their current efforts. Sparks Fire Department officials should look at policies and procedures to reduce turnout time closer to the recommended goal of 1 minute.

NLTFPD Total: For CY09 and CY10, total response times for NLTFPD averaged 08:05 with a 90th percentile of 12:13. When analyzing total response time, it is important to determine the time for the first unit to arrive on scene to compare against the NFPA recommendations. 90 percent of the time, the first NLTFPD unit arrived on the scene of an emergency medical call 9 minutes and 13 seconds after someone dialed 911.

Total response times (9:13 at the 90th percentile for the first arriving unit) are more than three minutes higher than the recommended time of 6 minutes for EMS calls. Figure 19 shows the 90th percentile total response time for the first arriving NLTFPD unit versus the overall total response time on EMS calls by time of day.

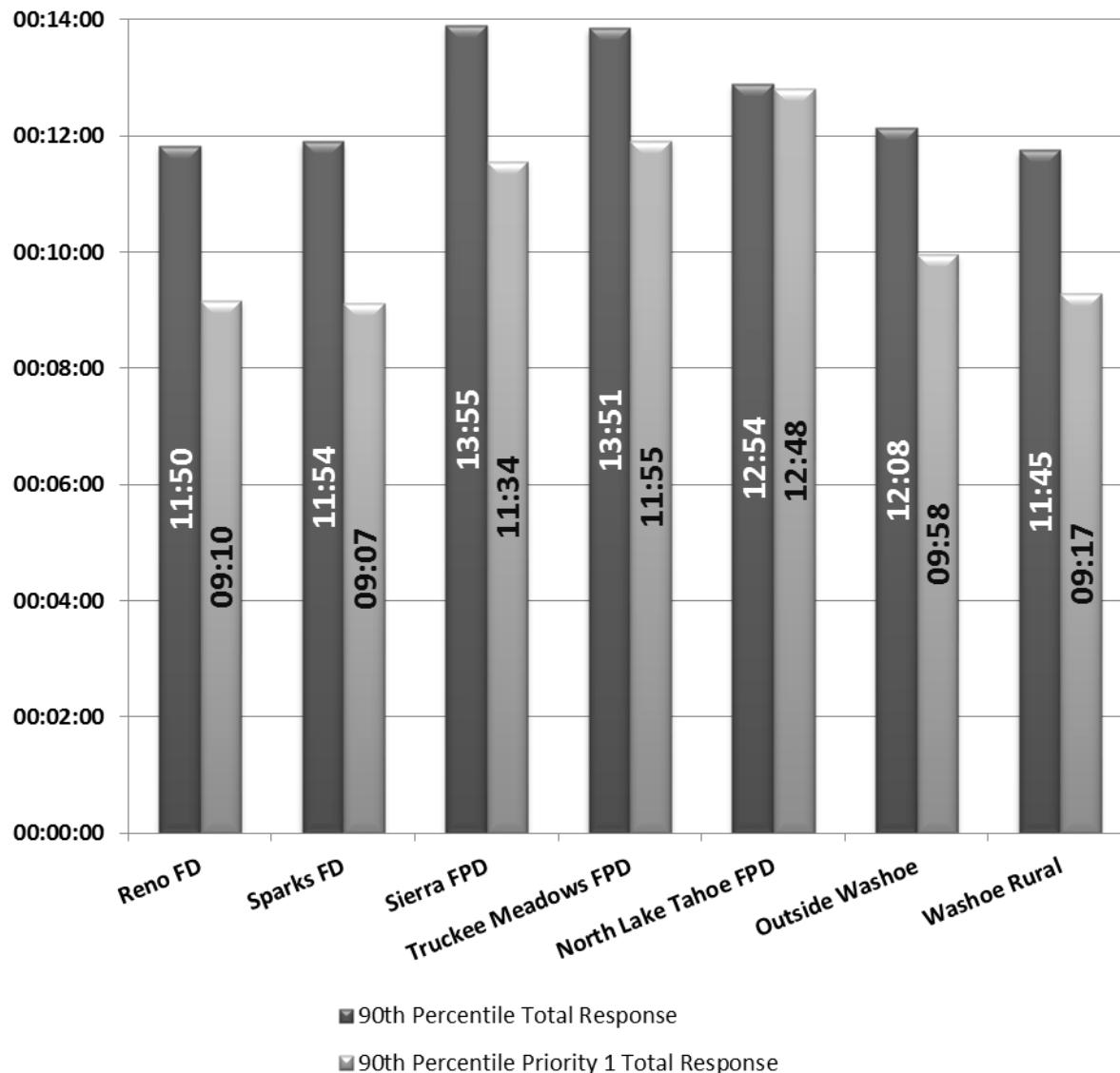
Figure 19: NLTFPD 90th Percentile Total Response Times
(Overall and First On Scene) By Time of Day, CY09 and CY10



The department should continue to take steps to reduce overall response times and improve 90th percentile compliance. Although Incline Village and Crystal Bay do not have high call volumes and do have difficult terrain, NLTFPD officials should look at policies and procedures to reduce all phases of response to move closer to the NFPA recommended goals.

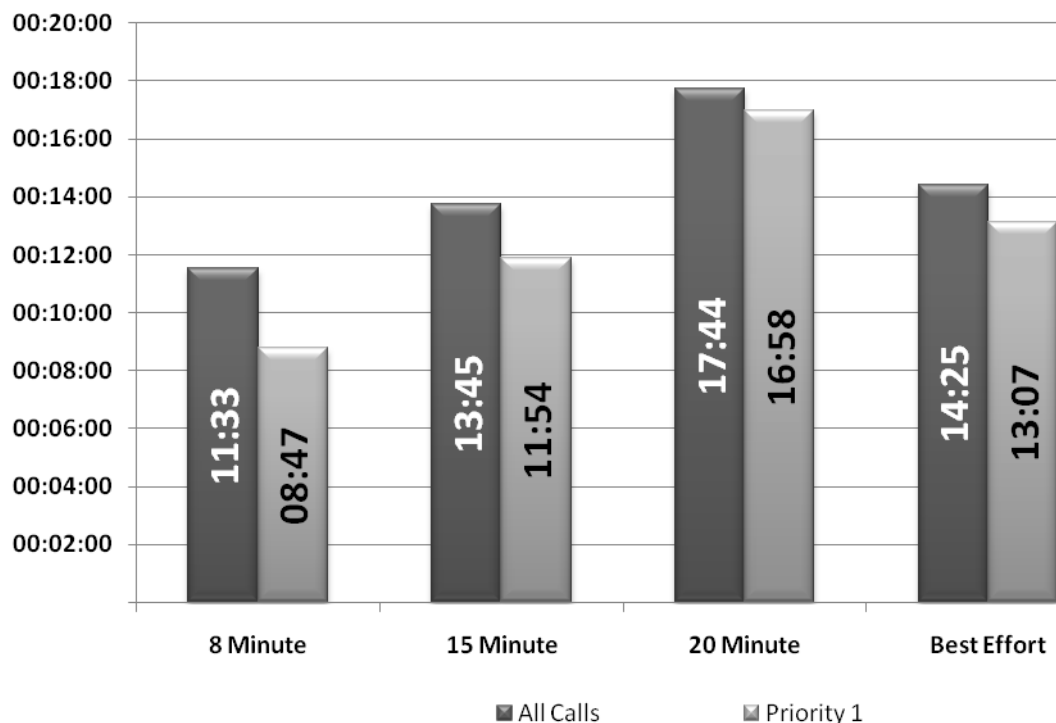
REMSA Total: For CY09 and CY10, total response times for REMSA averaged 06:48 with a 90th percentile of 12:07 for all calls and a 90th percentile of 09:36 for Priority 1 calls. Figure 20 shows the 90th percentile total response times for all calls and Priority 1 calls by fire protection district for CY09 and CY10.

**Figure 20: REMSA 90th Percentile Total Response Times
(Overall and Priority 1) By Fire Protection District, CY09 and CY10**



As discussed in the travel section, REMSA uses a response area map designed with the Washoe County Health District (Figure 43) to measure its effectiveness. Figure 21 shows total response times by response goal area for all calls and Priority 1 calls from CY09 and CY10.

**Figure 21: REMSA 90th Percentile Total Response Times
(Overall and Priority 1) By REMSA Response Goal, CY09 and CY10**



There is a controversy as to the interpretation of the meaning of eight minutes. Does it require eight minutes or less, or within 8 minutes and 59 seconds. The current franchise agreement specifically states *eight minutes*.²⁶ An interpretation agreed to by a former District Health Officer and REMSA define *eight minutes* as eight minutes and 29.99 seconds, with REMSA having the option to increase this to 8:59.99.^{27,28} Officially we can conclude that for Priority One responses in the urban response zone, REMSA is above eight minutes but within the eight minutes and 59 seconds requirement.

This interpretation is critical because the precise eight-minute response area has 81 percent of the overall call volume (69,282 out of 85,386 analyzed calls). With their high call volume in this area, REMSA adding an additional minute to the response time requirements may

²⁶ Washoe District Board of Health. (2005, Revised). Amended And Restated Franchise Agreement: Organizational, Performance And Operational Criteria For The Regional Emergency Medical Services Authority

²⁷ Begble, J. (1997, January). *Minutes regarding franchise compliance reporting on April 21 and September 4, 2007*. Washoe District Health Department, September 11, 1997, Section 9, p. 2.

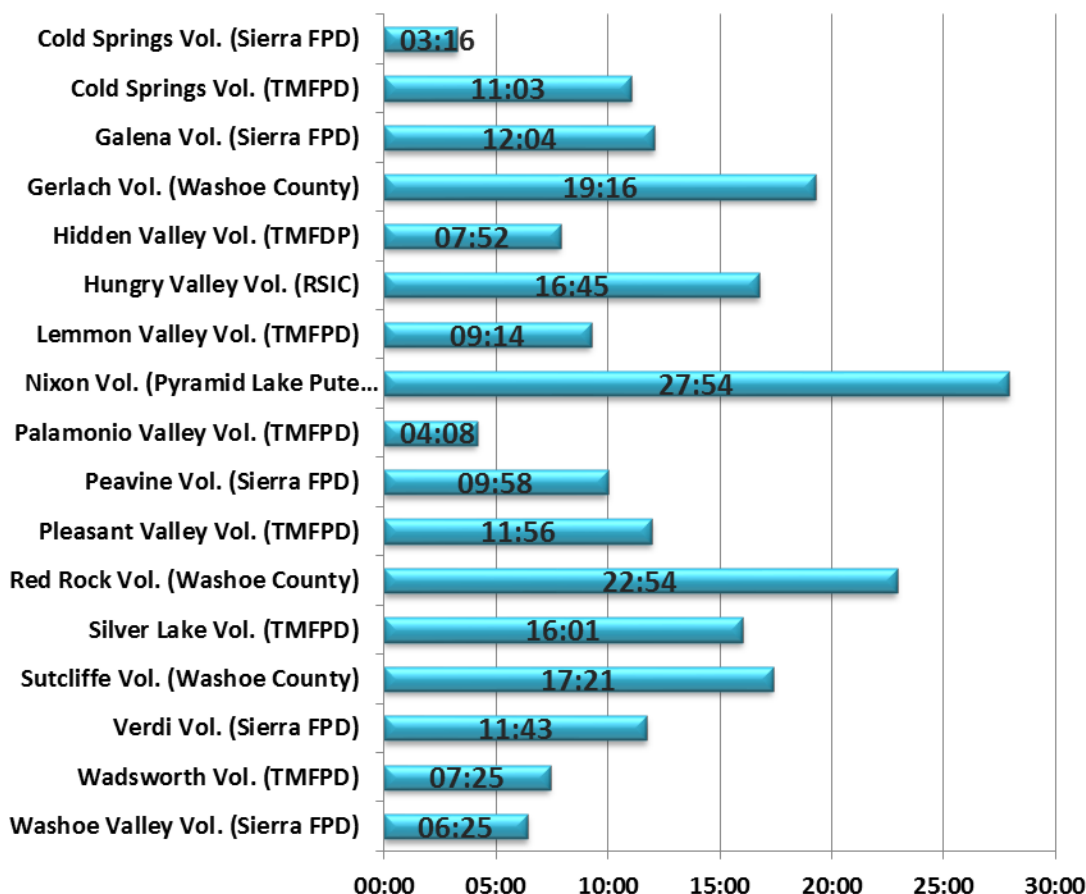
²⁸ We did not become aware of the September 11, 1997 agreement until August 2, 2012. While DHOB and REMSA may mutually agree to amend the franchise agreement, final approval must be formally granted by the DBOH. There is no evidence of this occurring. Our assessment is based off of an 8:00 timeline, but we will comment as appropriate.

spark controversy. From an operational standpoint, a total response time of eight minutes and 59 seconds for Priority One calls is reasonable and is identical to CAAS standards.

REMSA should look at methods for reducing response time segments such as turnout, which was almost a minute over the NFPA and CAAS recommended time of 01:00.

Washoe County Volunteers Total: Figure 22 shows the 85th percentile total response time for the volunteer fire departments in Washoe County. For the most part, the departments have acceptable response times based on the minimum service standards. Nixon VFD has the highest response time, most of it comes from the travel segment, and also the most responses during the study period. Given their rural location, Nixon should look at ways of decreasing their total response time. Programs might include increasing medical capability by staffing apparatus overnight to decrease turnout time.

Figure 22: 85th Percentile Total Response Times for Volunteer Fire Depts., CY10 and CY11



Analysis of Station and Apparatus Locations

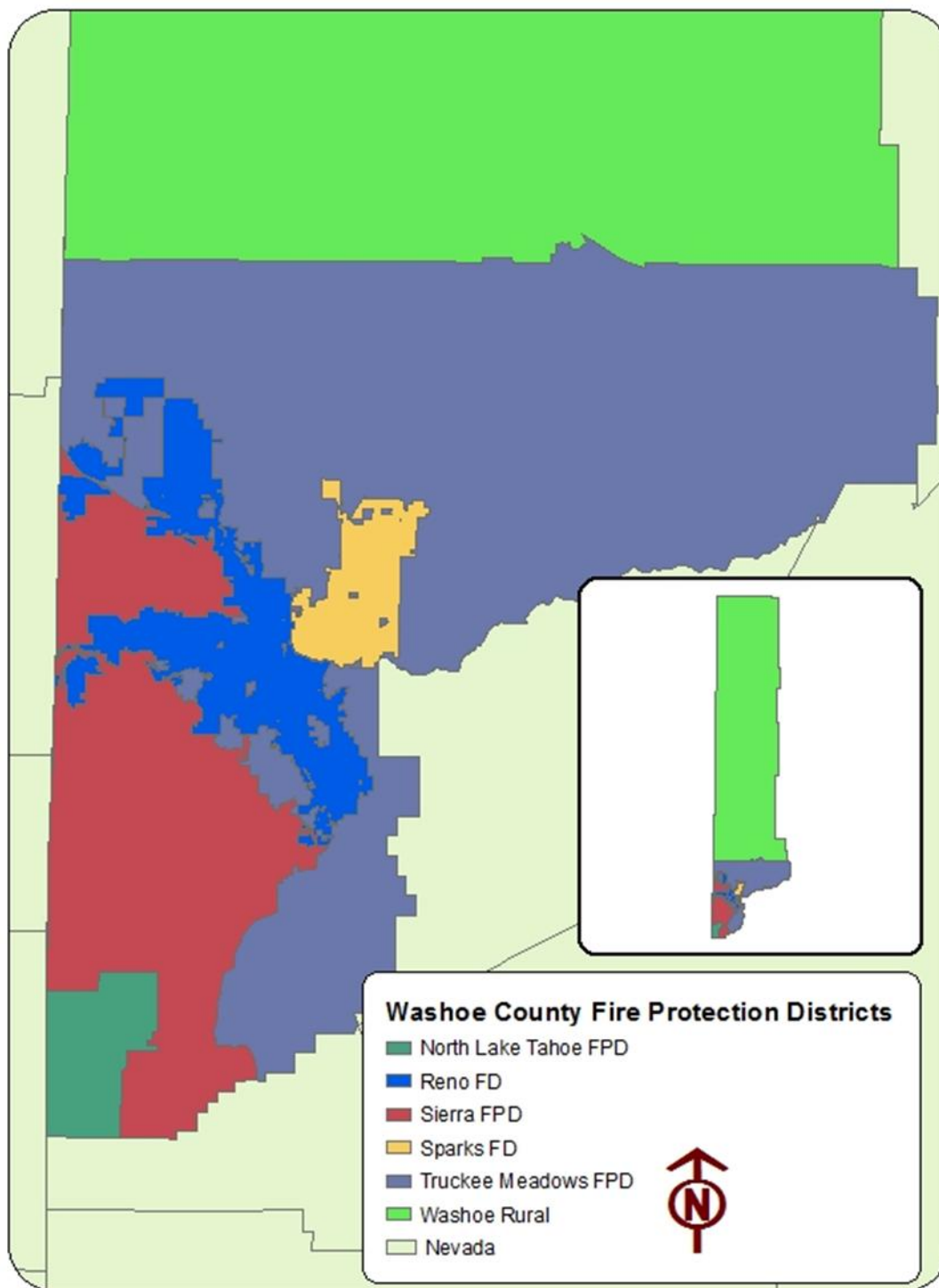
This section provides an in-depth look at station location and apparatus placement. The primary objective is to determine what areas, if any, are in need of additional resources and how resources can be distributed to serve the city more efficiently. Travel areas are shown for stations

to determine what areas of the respective fire protection districts should be covered in a given amount of time.

Maps are included to show theoretical response reaches based upon the current station and apparatus locations. These theoretical response reaches are based on the length of road segments and speed limit attributes contained in road centerline data from the Washoe County GIS Department.

Figure 23 shows the boundaries of the fire protection districts (FPD) in Washoe County. Each FPD, their stations, and their response capabilities will be analyzed separately.

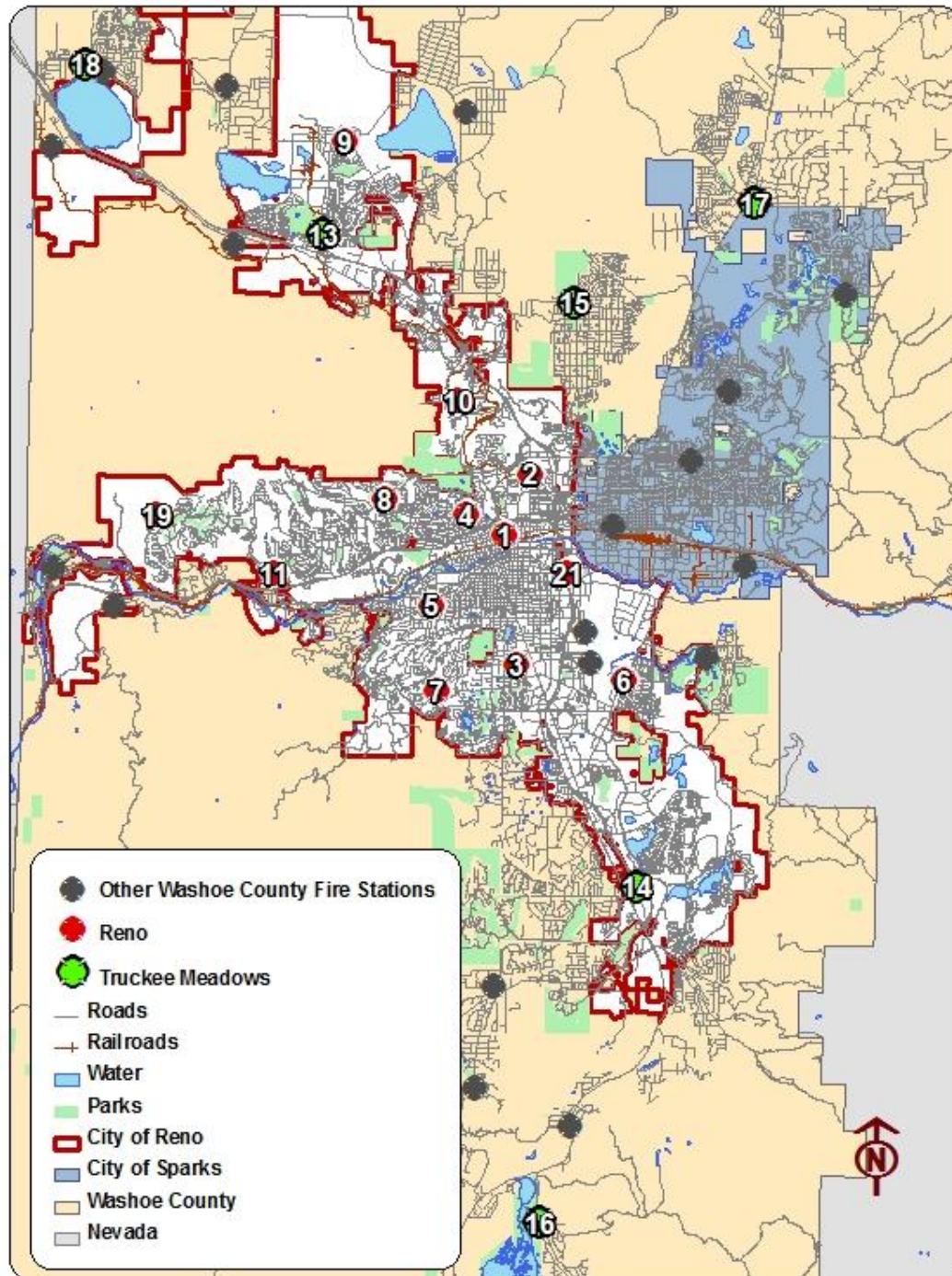
Figure 23: Fire Protection Districts in Washoe County



Reno Fire Department – The City of Reno boundary also serves as the boundary for the Reno Fire Department. The City of Reno operates 13 of its own fire stations and managed the six stations owned by the TMFPD. On July 1, 2012, the TMFPD separated from Reno and began to work under a cooperative agreement with the Sierra Fire Protection District. This analysis will

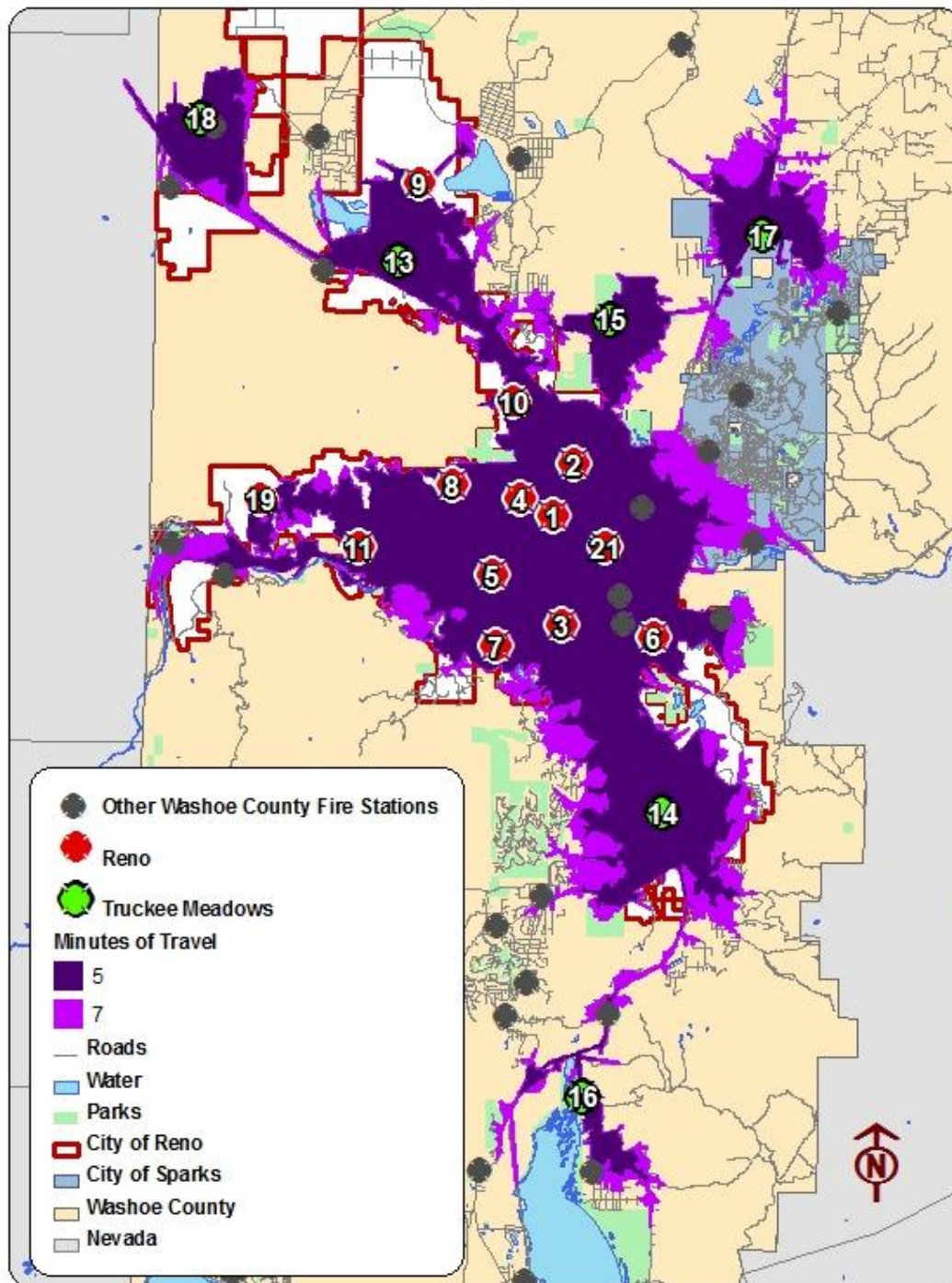
look at both the current operations and the effect the transition will have and make recommendations based on the separation. Figure 24 shows the current Reno Fire Department and TMFPD fire stations.

Figure 24: Reno Fire Department and TMFPD Stations



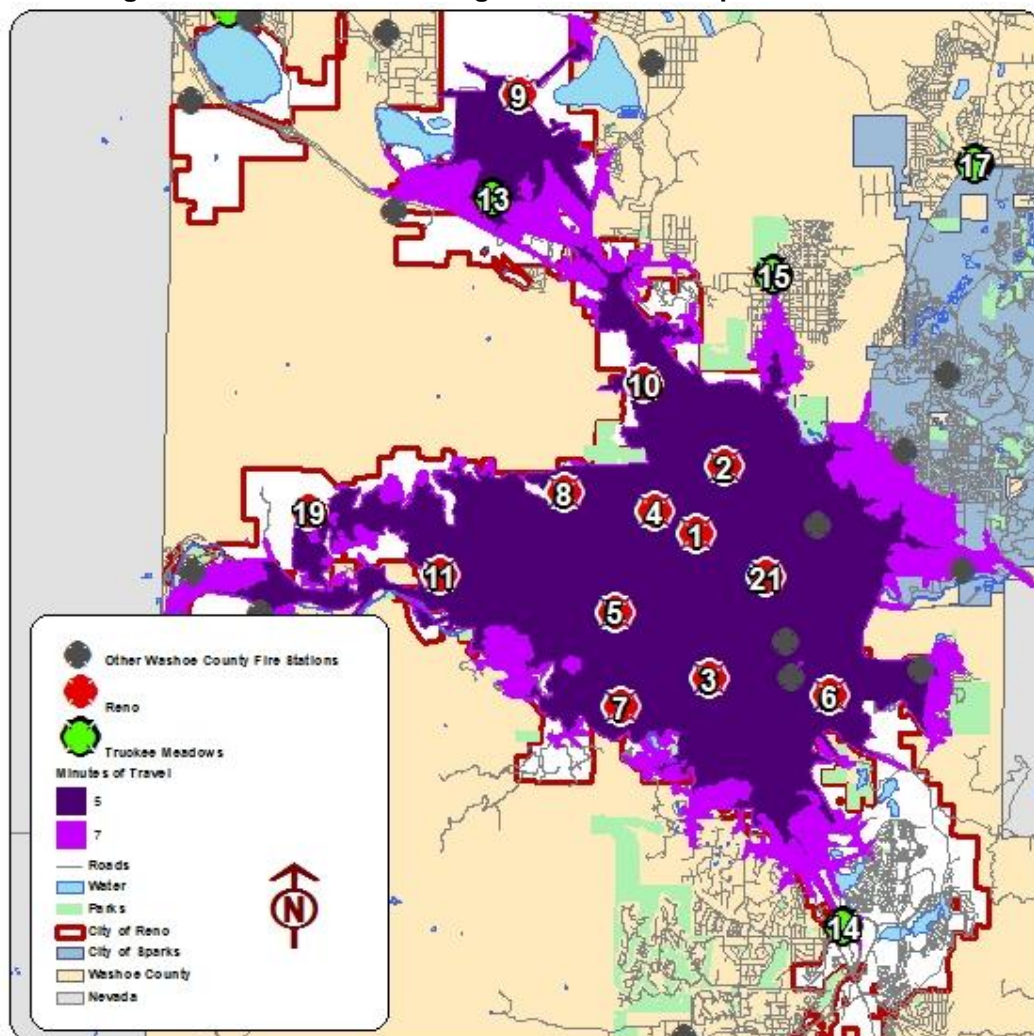
Given their performance goals of dispatch to arrival within 6 minutes in the urban zone and 8 minutes in the suburban zone, coverage polygons were created for 5 and 7 minutes (allowing 1 minute of turnout time). Figure 25 shows the theoretical coverage areas for Reno operated stations at 5 and 7 minutes.

Figure 25: Theoretical Coverage Area for Reno Fire Department Operated Stations



Although, there will not be a change in actual coverage after the separation (Truckee Meadows stations are not moving or closing), Figure 26 shows the coverage for Reno stations only. Automatic aid and mutual aid agreements should be kept in place to ensure coverage for these areas. Reno also uses a policy of rotating closures (brownouts) that close different stations at different times to reduce staffing costs. After July 1, 2012, there may be station closures in Reno. We were not made aware of any decisions.²⁹

Figure 26: Theoretical Coverage for Reno Fire Department Stations

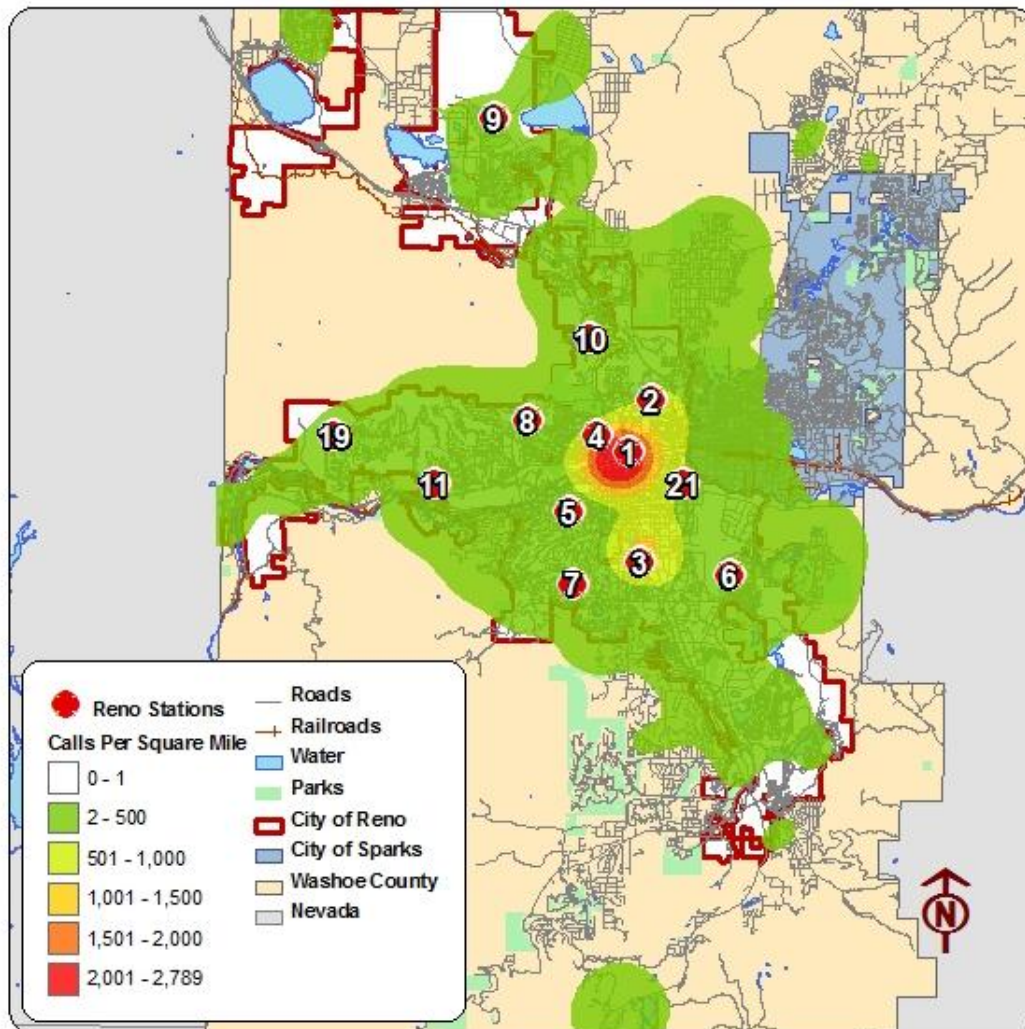


Knowing where incidents are occurring is one of the most important considerations when looking at station and apparatus location. Therefore, this analysis also takes into account geocoded incidents and resulting incident density for the career departments. 18,884 of the 21,664 (87 percent) of the CY10 and CY11 EMS incidents that Reno Fire Department (Reno

²⁹ Recently, the City of Reno received a SAFER grant that will allow them to keep all stations open for the next two years.

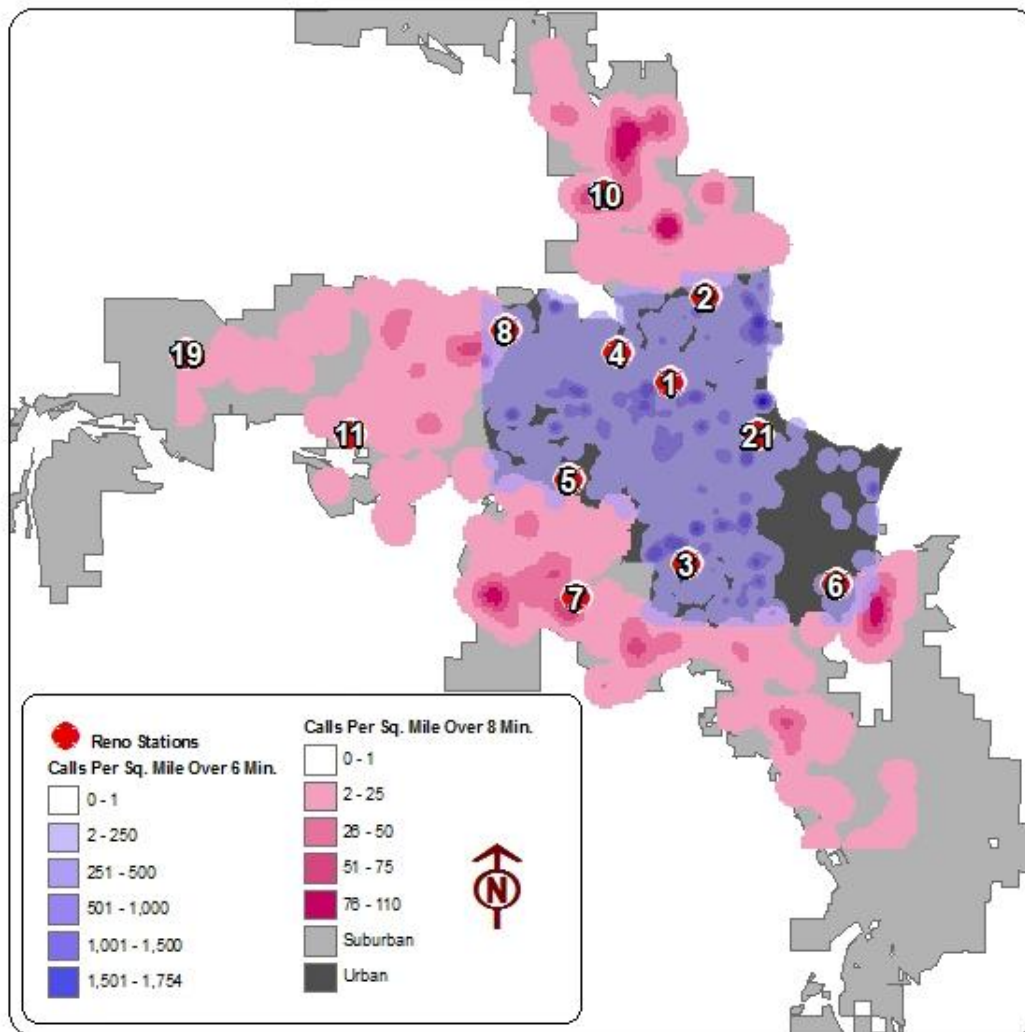
stations only) responded to were successfully geocoded. The resulting incident shows that most EMS calls occur in downtown Reno, very near stations 1 and 4. Figure 27 shows the medical calls per square mile responded to by Reno Fire Department units in CY10 and CY11.

Figure 27: Reno Fire Department EMS Calls per Square Mile, CY10 and CY11



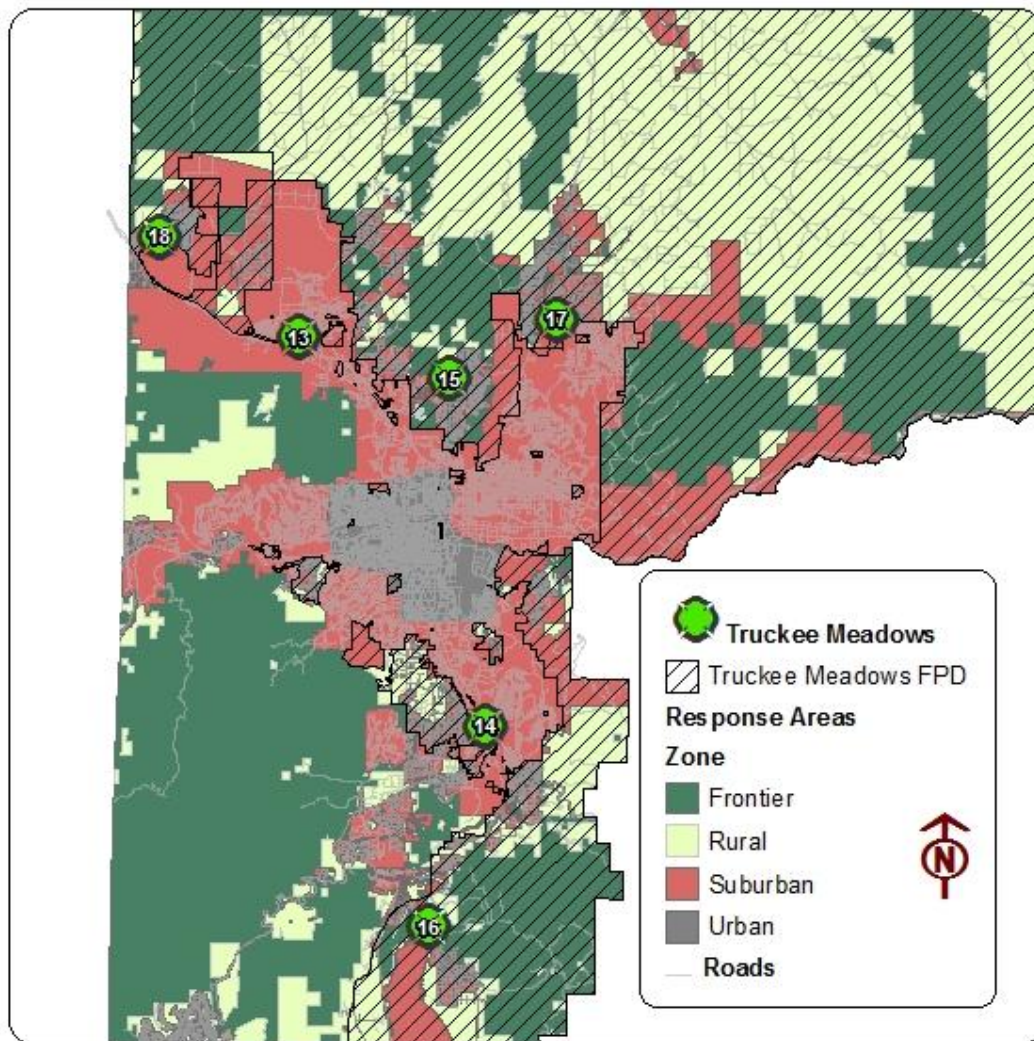
Since Reno has two different performance zones based on population density, geocoded calls were filtered by zone and densities were determined for response times (dispatch to arrival) over 6 minutes for the urban zone (2,235 calls) and over 8 minutes for the suburban zone (470 calls), for the first arriving unit. Figure 28 shows these resulting densities. For the most part, the urban zone has only small pockets (relative to the number of calls), but there are several areas of concern in the suburban zone (relative to number of calls in the zone). Reno Fire Department should look at ways to decrease the response times in these areas. The issue concerning closed or browned out stations should also be considered here.

Figure 28: Calls per Square Mile Exceeding the Reno Performance Zone Goal, CY10 and CY11



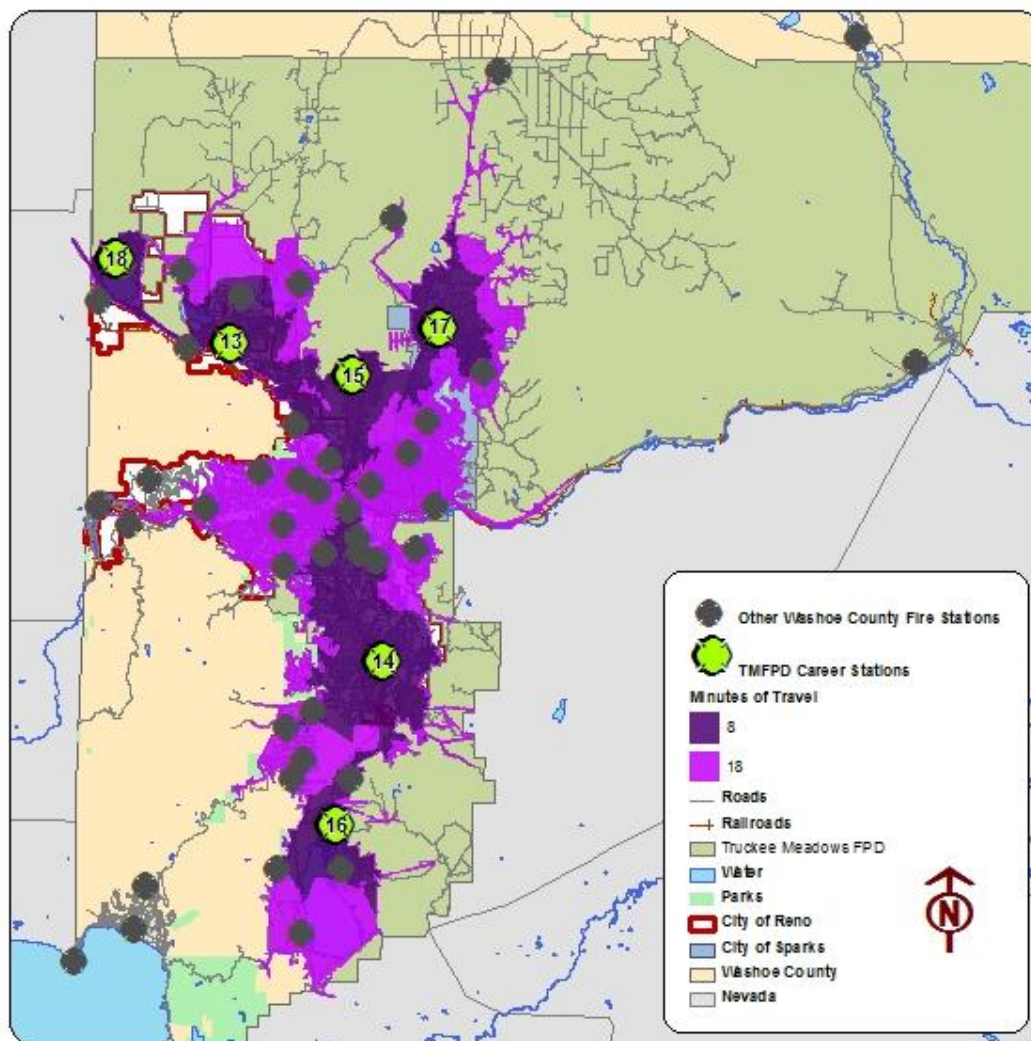
Truckee Meadows Fire Protection District – After the transition is complete in mid-2012, the TMFPD will begin to operate its own stations. The TMFPD is bisected by the cities of Reno and Sparks and is mostly rural or frontier, with suburban areas near the cities. All of the TMFPD stations are located in the suburban performance zones. Figure 29 shows the location of the TMFPD stations in relation to the Washoe County Performance Zones.

Figure 29: TMFPD Stations and Washoe County Performance Zones



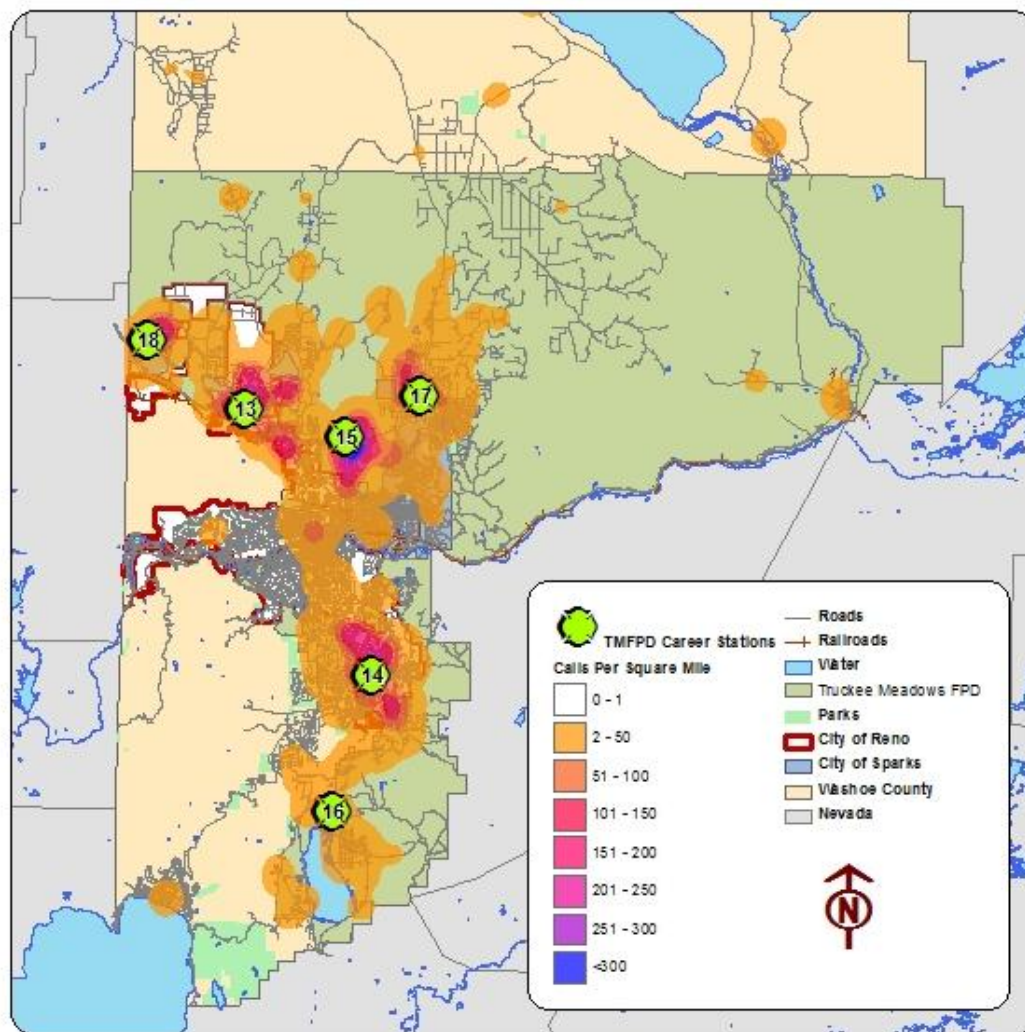
Theoretical coverage times of 8 and 18 minutes were developed for Truckee Meadows stations. These coverages were based on Washoe County minimal standards of 10 minutes for suburban and 20 minutes for rural, minus 2 minutes from each for call handling and turnout time. Figure 30 shows the theoretical coverage areas for TMFPD with 8 and 18 minutes of travel.

Figure 30: Theoretical Coverage for TMFPD Stations with 8 and 18 Minutes of Travel



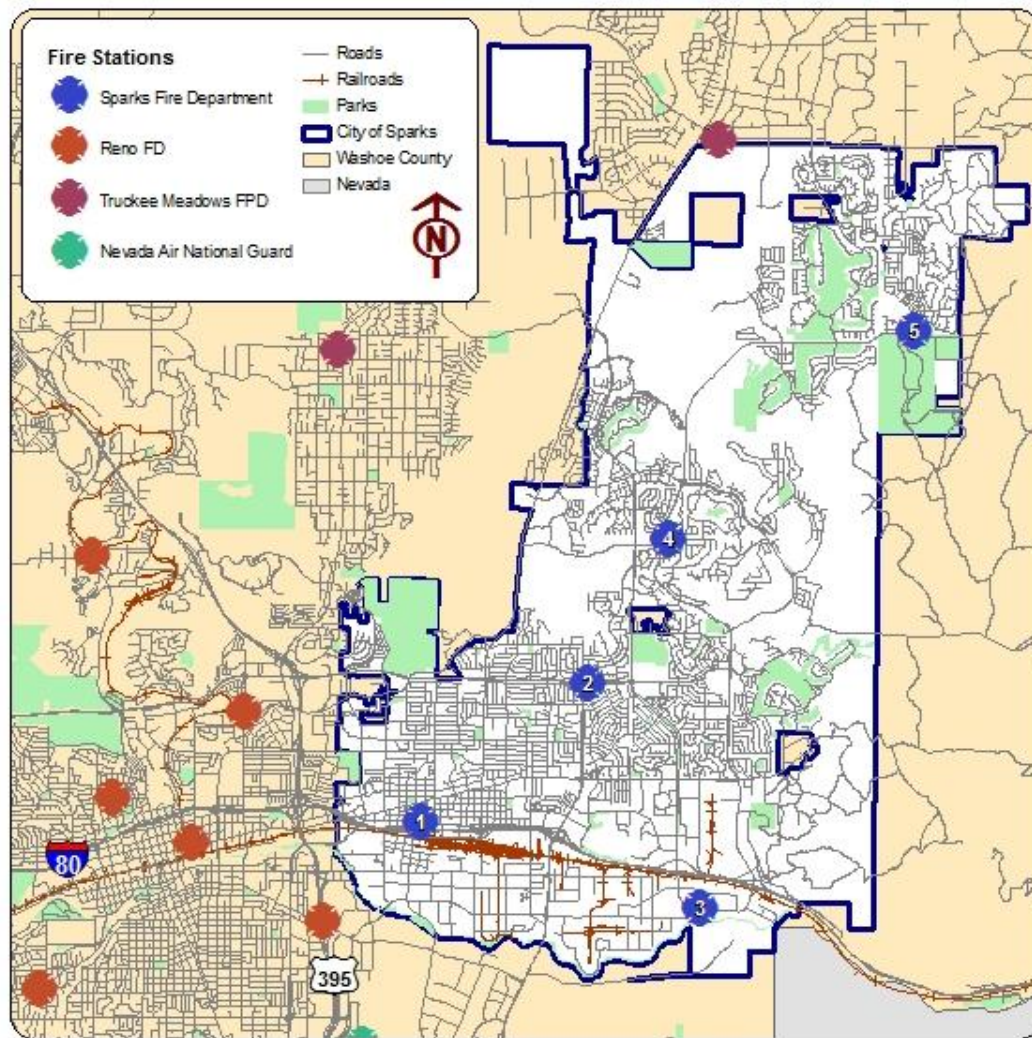
Truckee Meadows stations are well placed to handle the suburban areas of the district; additional stations would be dependent on demand and budget. In CY10 and CY11, Truckee Meadows units responded to 11704 calls for medical services. 8,221 of these calls successfully geocoded (70%) to determine call density for TMFPD units. Figure 31 shows the density of EMS calls for Truckee Meadows units for CY10 and CY11. Based on this density, the current configuration, along with continued mutual or automatic aid agreements with Reno and Sparks should be adequate to provide coverage for residents in the TMFPD.

Figure 31: TMFPD EMS Call Density, CY10 and CY11



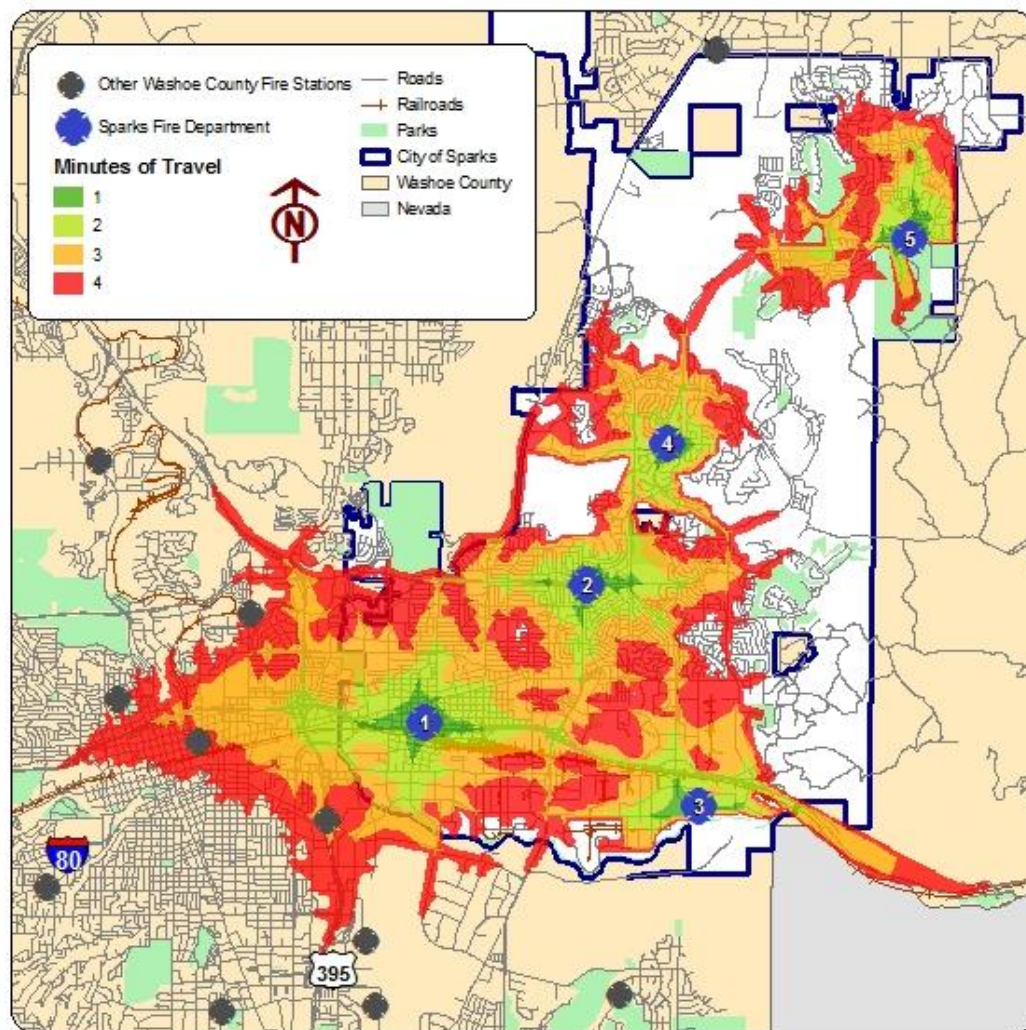
Sparks Fire Department – Similar to Reno, the Sparks city boundary outlines their response area. Sparks provides fire and EMS response from 5 fire stations. Figure 32 shows the current Sparks Fire Department stations.

Figure 32: Sparks Fire Department Stations



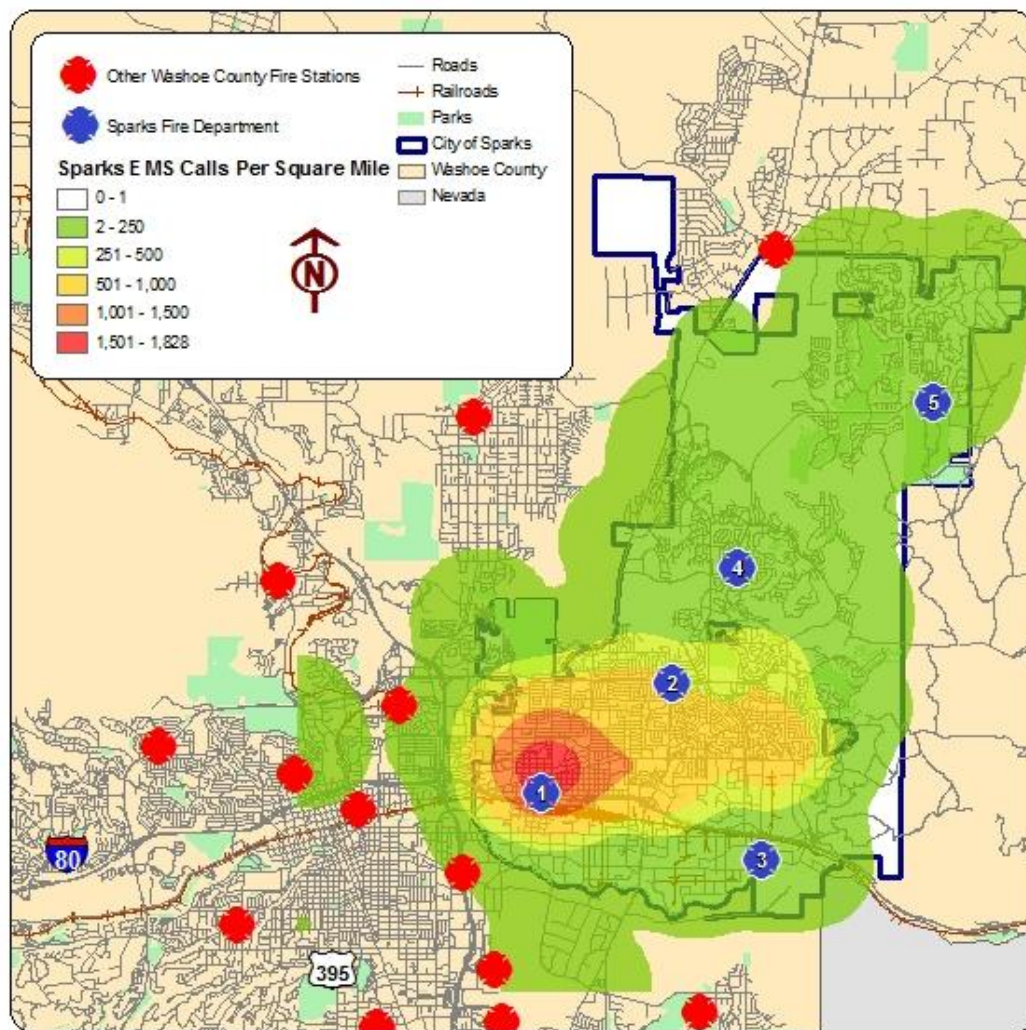
As discussed in the previous response time section, NFPA 1710 recommends that the first unit on scene arrive within 6:00 minutes of the initial call. Allowing 1:00 minute of dispatch and 1:00 minute of turnout gives a travel time of 4:00 minutes. Figure 33 shows the theoretical 4:00 minute travel times for units departing from their stations.

Figure 33: Sparks Fire Department 4 Minute Theoretical Coverage Area



The October 2009-September 2011 CAD data included 12,254 unique emergency medical incidents, of which 9,727 (80 percent) were geocoded. Using a density surface derived from the geocoded incidents, Figure 34 shows the density of emergency medical incidents per square mile.

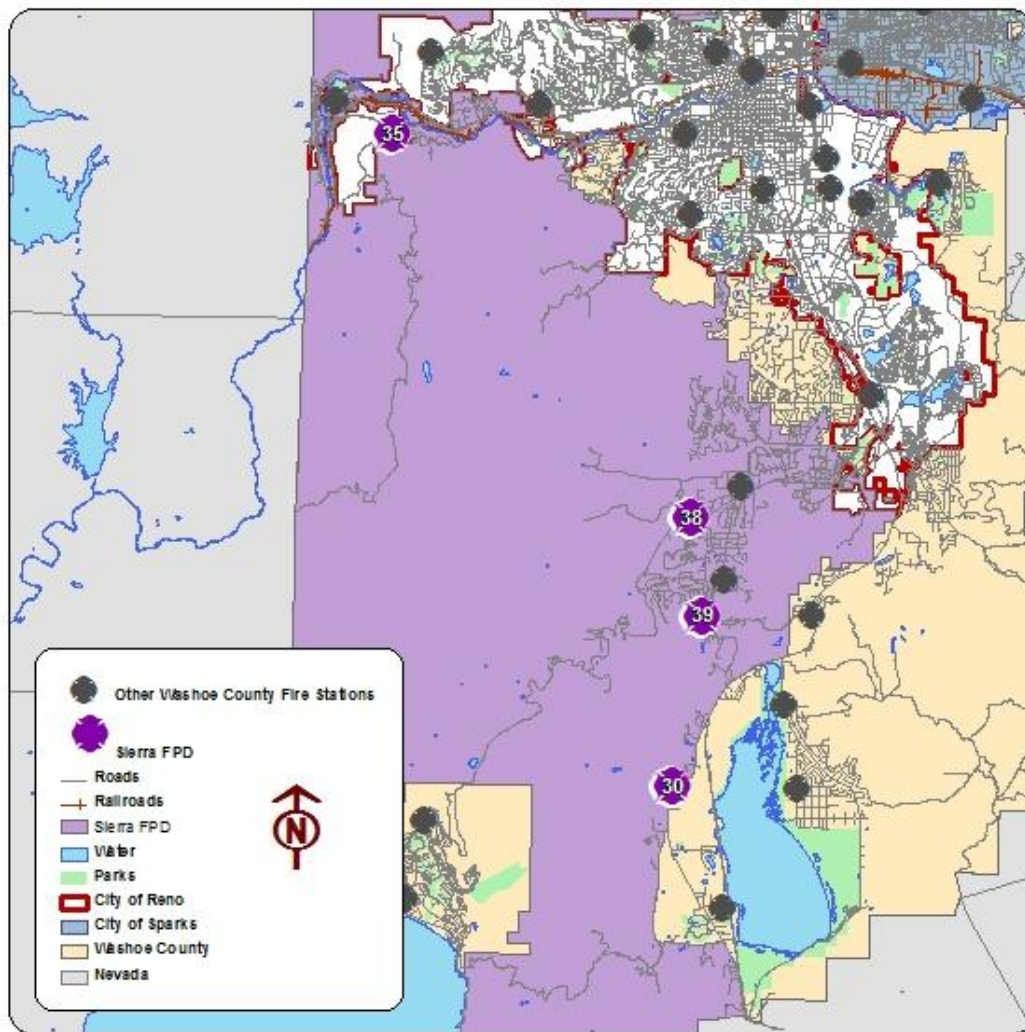
Figure 34: Sparks Fire Department EMS Incident Density, October 2009–September 2011



Based on where the incidents are occurring and the 4-minute theoretical response reach, a large majority of the incidents are able to be reached in 4 minutes. In fact, the majority of calls are within only a few blocks of station 1 which houses two EMT-Intermediate (EMT-I) capable engines.

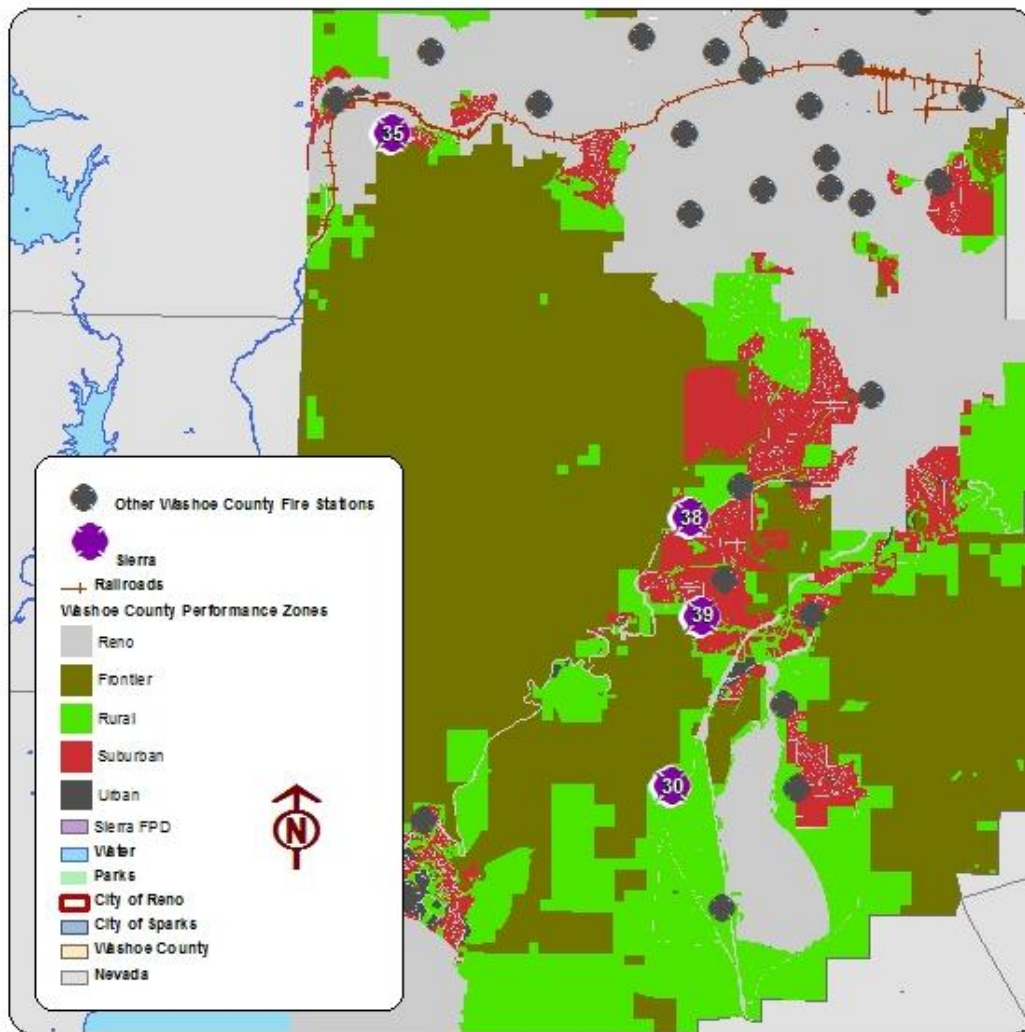
Sierra Fire Protection District – The SFPD is located in the southwestern portion of Washoe County. SFPD operates career stations 30, 38, and 39 on the eastern edge of their district, and station 35 on the north edge of their district. Figure 35 shows the location of the SFPD stations.

Figure 35: SFPD Stations



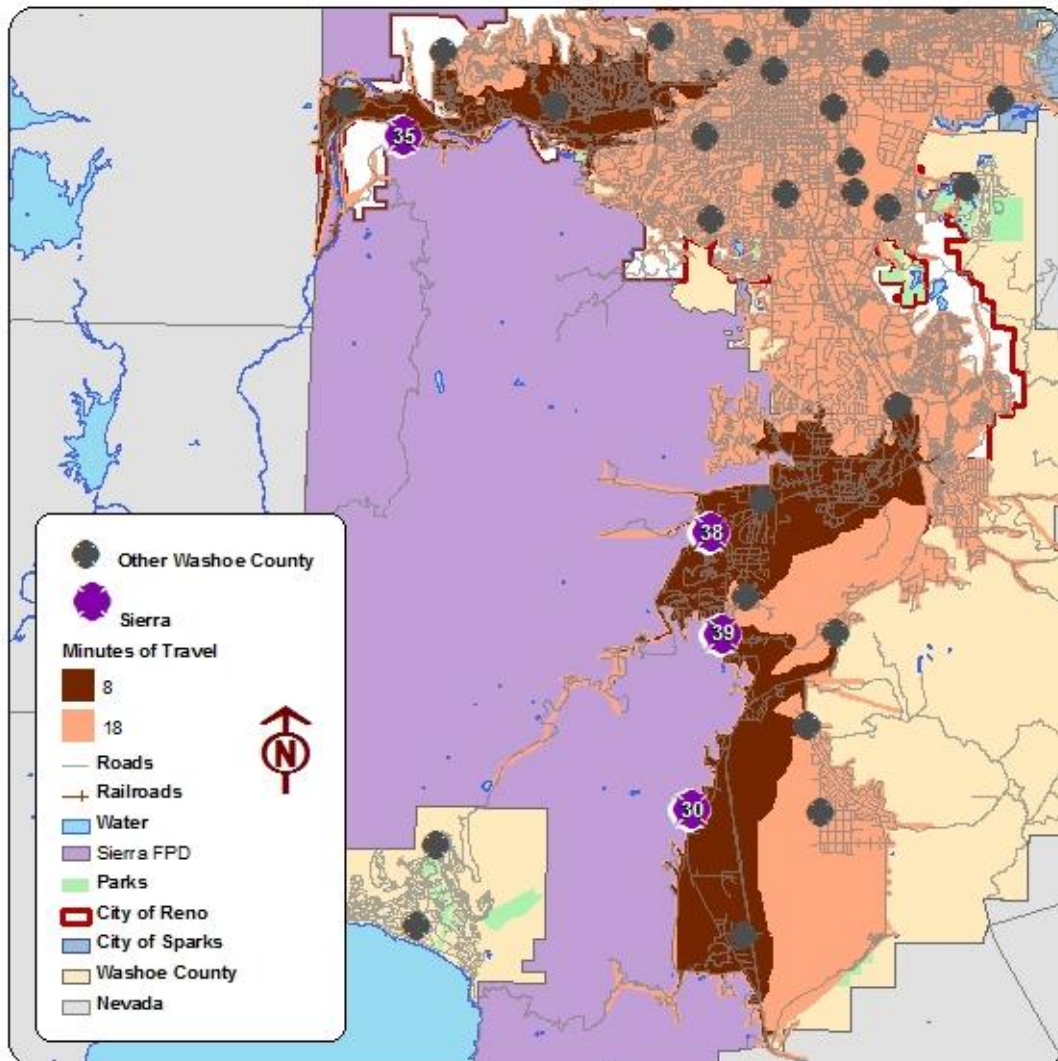
The SFPD is comprised of mainly frontier performance zone with suburban and rural zones on the edges, where the stations are located. Figure 36 shows the Washoe County performance zones in relation to the SFPD stations.

Figure 36: SFPD Stations and Washoe County Performance Zones



Given the location of the SFPD stations, theoretical coverage times of 8 and 18 minutes were developed. Coverages were developed similarly to Truckee Meadows using Washoe County minimal standards of 10 minutes for suburban and 20 minutes for rural, minus 2 minutes from each for call handling and turnout time. Figure 37 shows the theoretical coverage areas for SFPD with 8 and 18 minutes of travel.

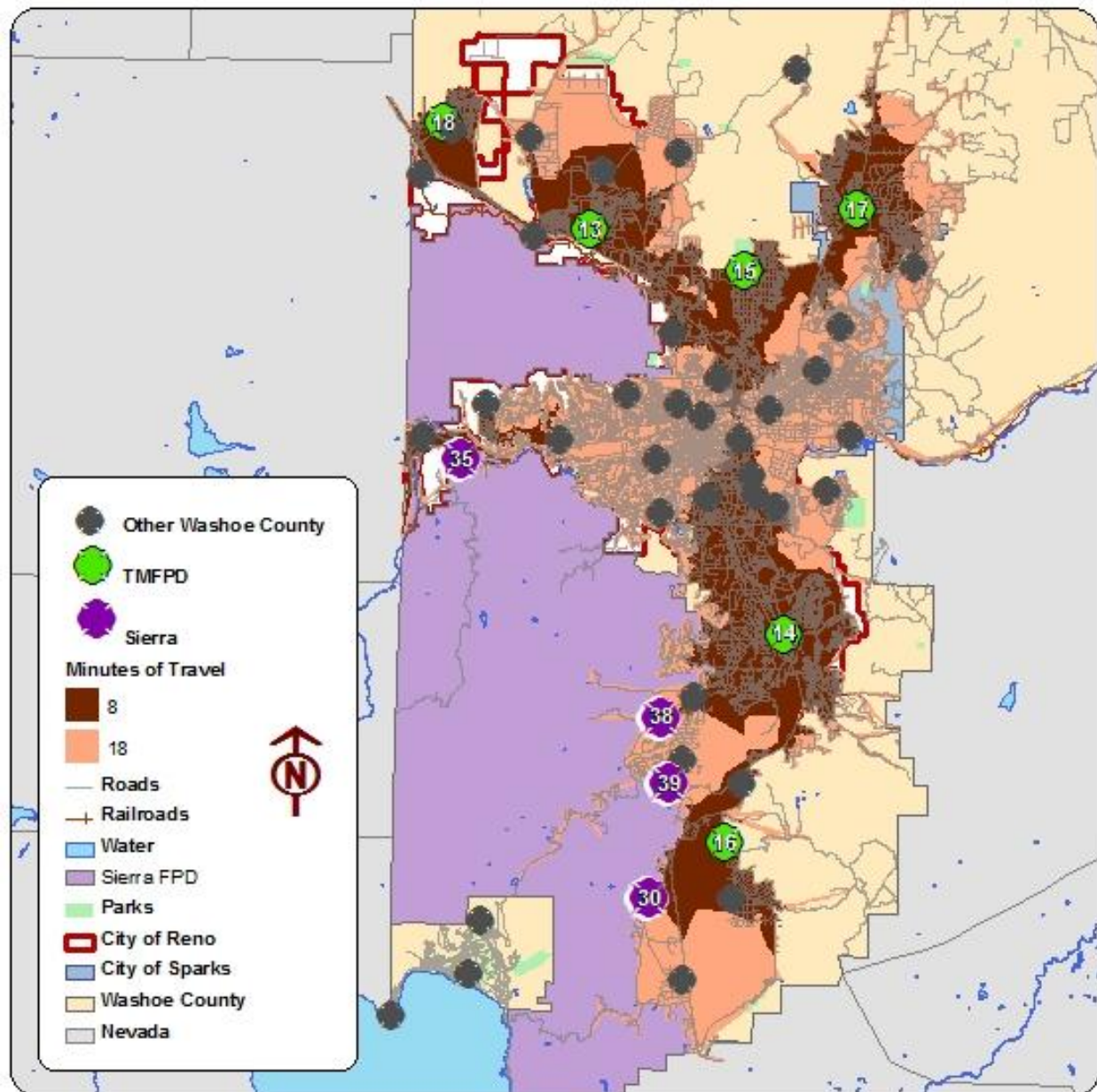
Figure 37: Theoretical Coverage for SFPD Stations



Based on the road network, most of the coverage extends into Truckee Meadows and Reno; however Sierra should be able to cover most of their suburban and rural areas within the recommended goals.

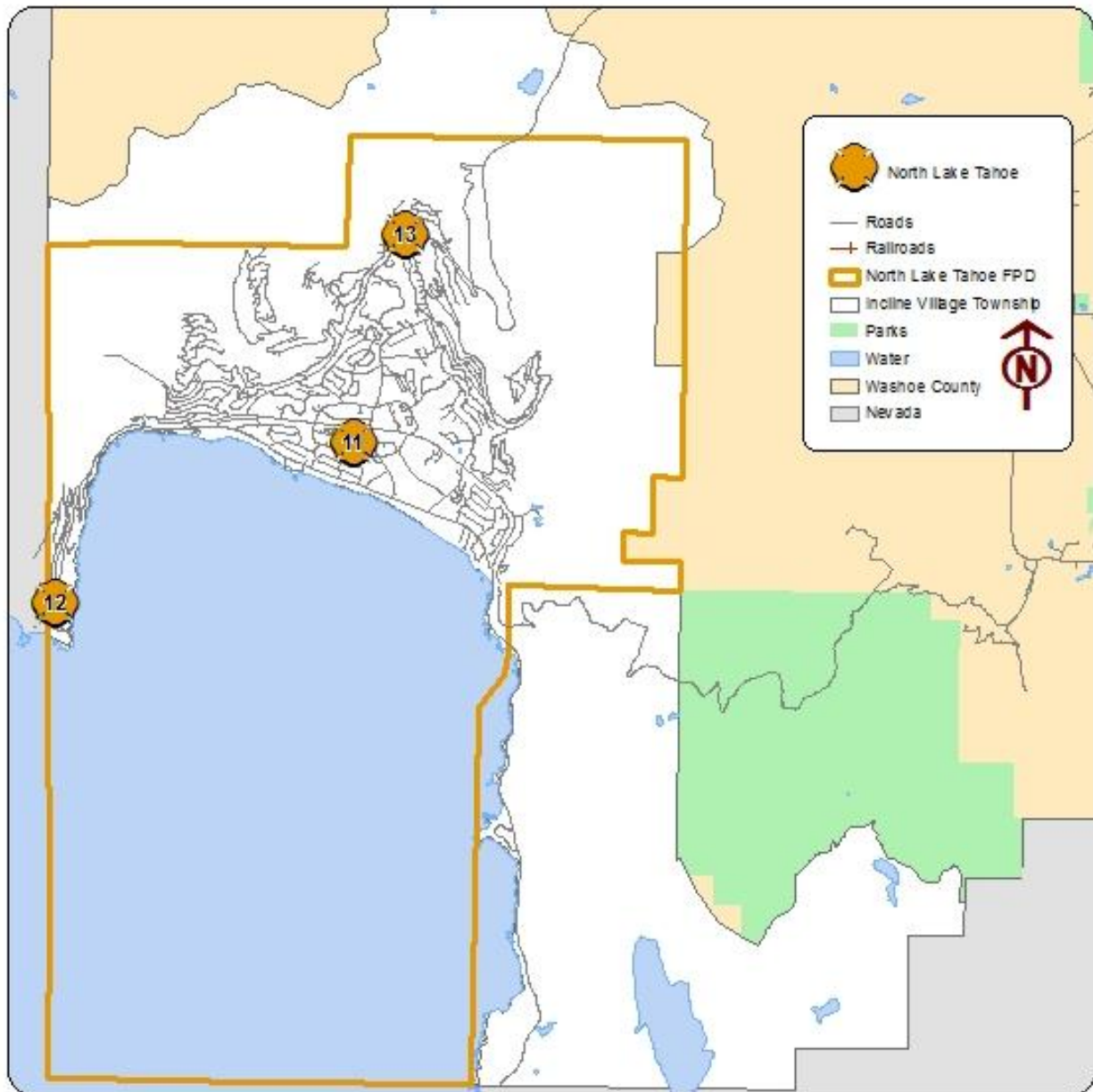
Figure 38 shows the new 8 and 18 minute theoretical coverage area following the merger of Sierra and Truckee Meadows Fire Protection Districts.

Figure 38: Combined TM and Sierra Fire Protection Districts



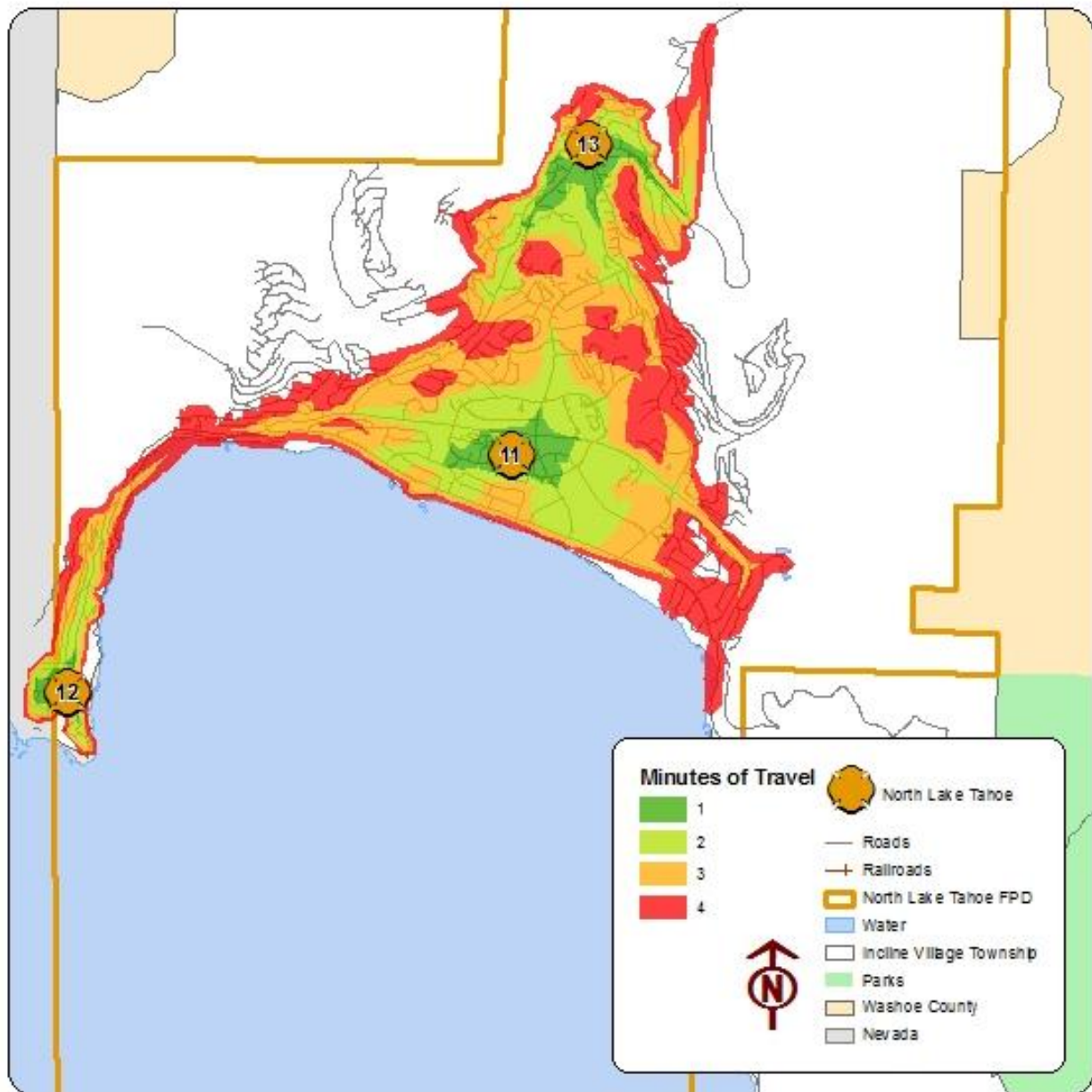
North Lake Tahoe Fire Protection District – NLTFPD provides fire and EMS response from 3 stations. Figure 39 shows the current NLTFPD stations.

Figure 39: NLTFPD Stations



As discussed in the previous response time section, NFPA 1710 recommends that the first unit on scene arrive within 6:00 minutes of the initial call. Allowing 1:00 minute of dispatch and 1:00 minute of turnout gives a travel time of 4:00 minutes. Figure 40 shows the theoretical 4:00 minute travel times for units departing from their stations.

Figure 40: NLTFPD 4 Minute Theoretical Coverage Area



The CY09 and CY10 CAD data included 1,840 unique emergency medical incidents, of which 1,575 (86 percent) geocoded. Using a density surface derived from the geocoded incidents, Figure 41 and Figure 42 shows the density of emergency medical incidents per square mile. Figure 42 also shows all geocoded EMS incidents, including a hotspot at Mt. Rose Ski Resort.

Figure 41: NLTFPD Fire Department EMS Incident Density, CY09 and CY10

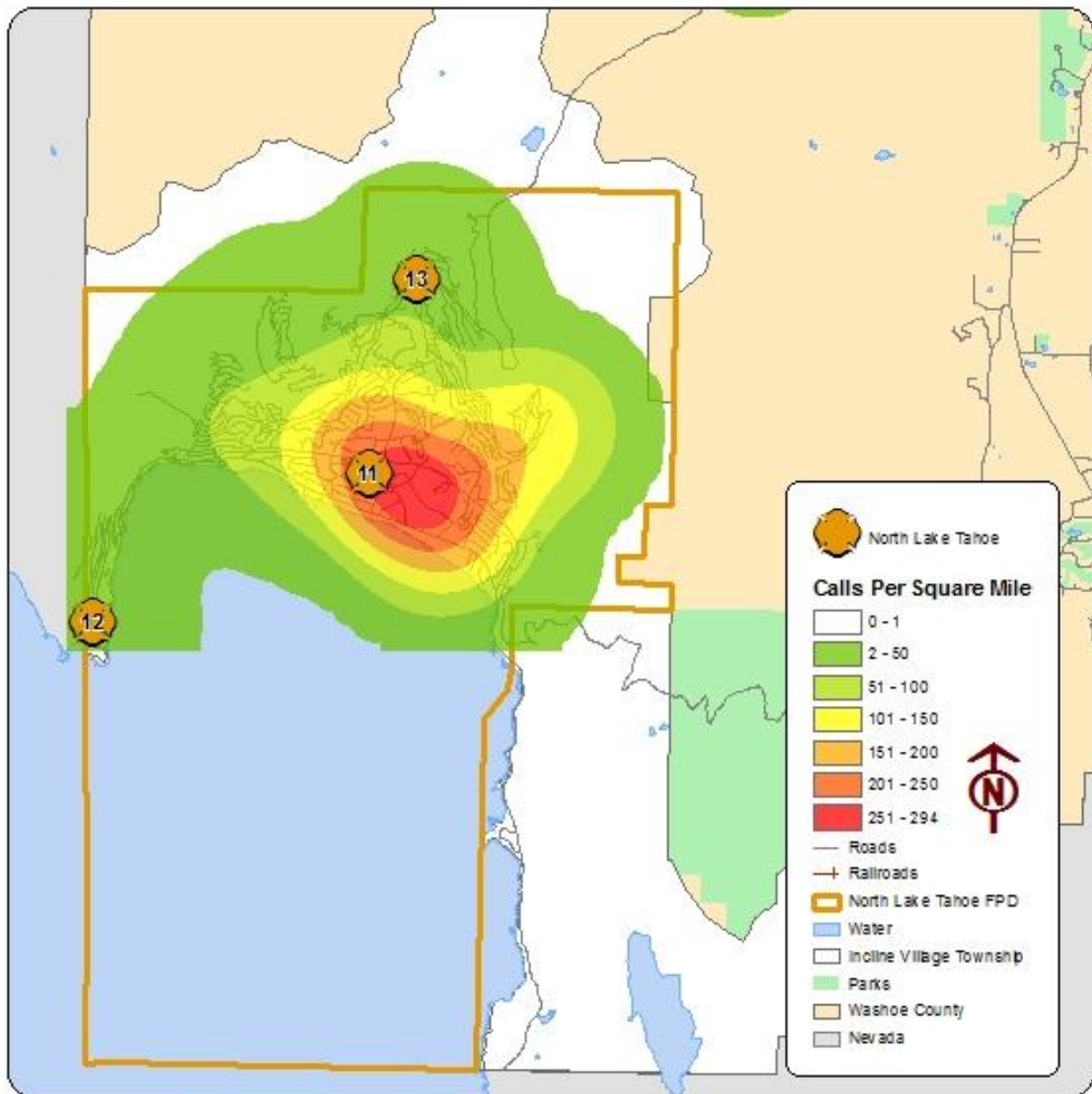
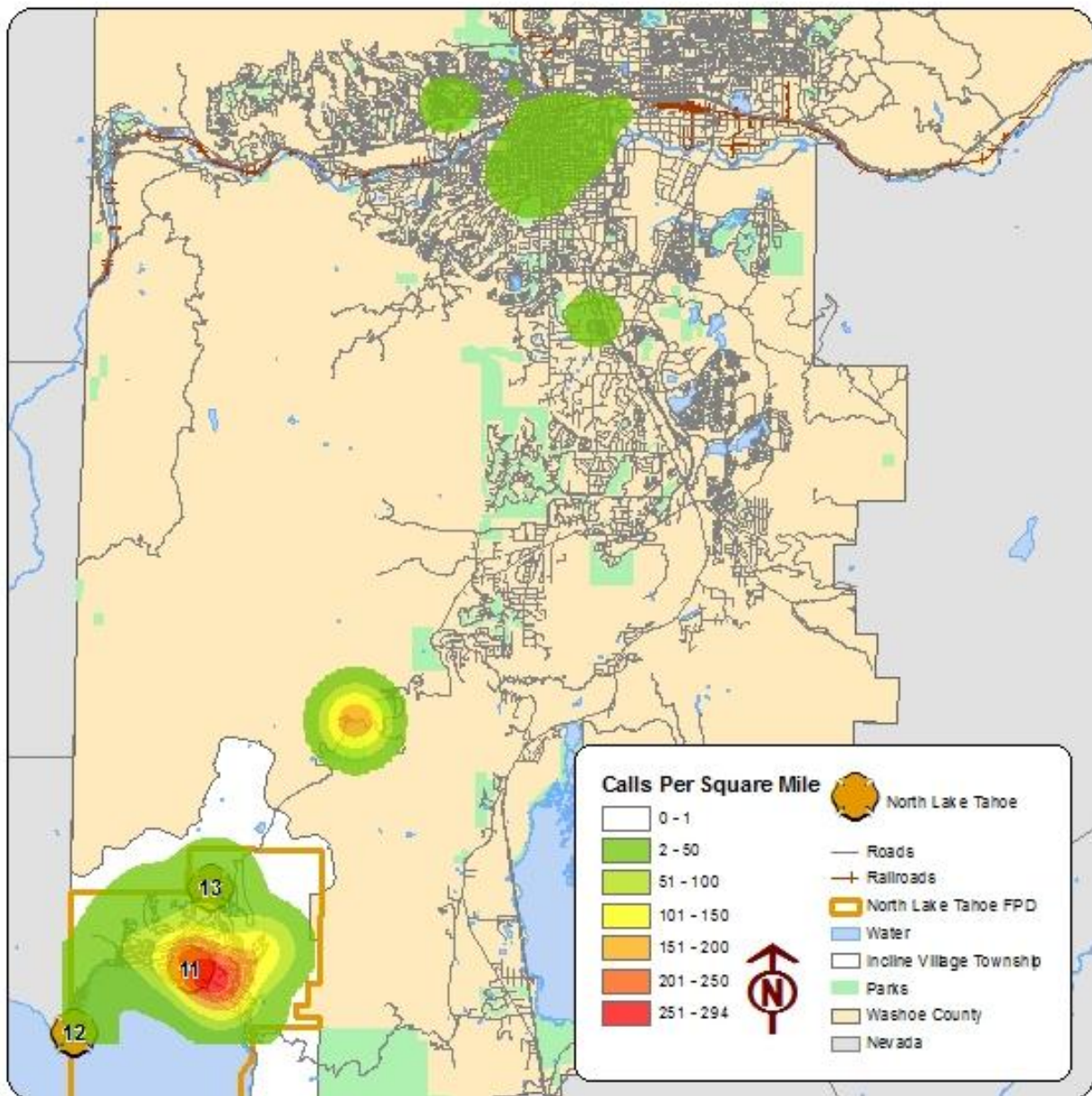


Figure 42: NLTFPD EMS Incident Density, Expanded View CY09 and CY10



Based on where the incidents are occurring and the 4-minute theoretical response reach, a large majority of the incidents in Incline Village – Crystal Bay are reachable within the 4 minute travel range. It is understandable that EMS response to the Mt. Rose Ski Resort would be outside of the theoretical reach.

Regional Emergency Medical Services Authority – REMSA uses the dynamic dispatching model, which constantly moves transport units around in order to maintain coverage of their response areas, as opposed to responding from dedicated stations. REMSA and the Washoe County Health District developed a response map, which outlined the response time goals for Priority 1 calls in their service area. Figure 43 shows the response time goals for

REMSA in Washoe County. The “Best Effort” polygon extends north to the northernmost border of Washoe County. Figure 44 shows how these response goals affect the Fire Protection Districts they provide transport for.

Figure 43: REMSA Response Area Map

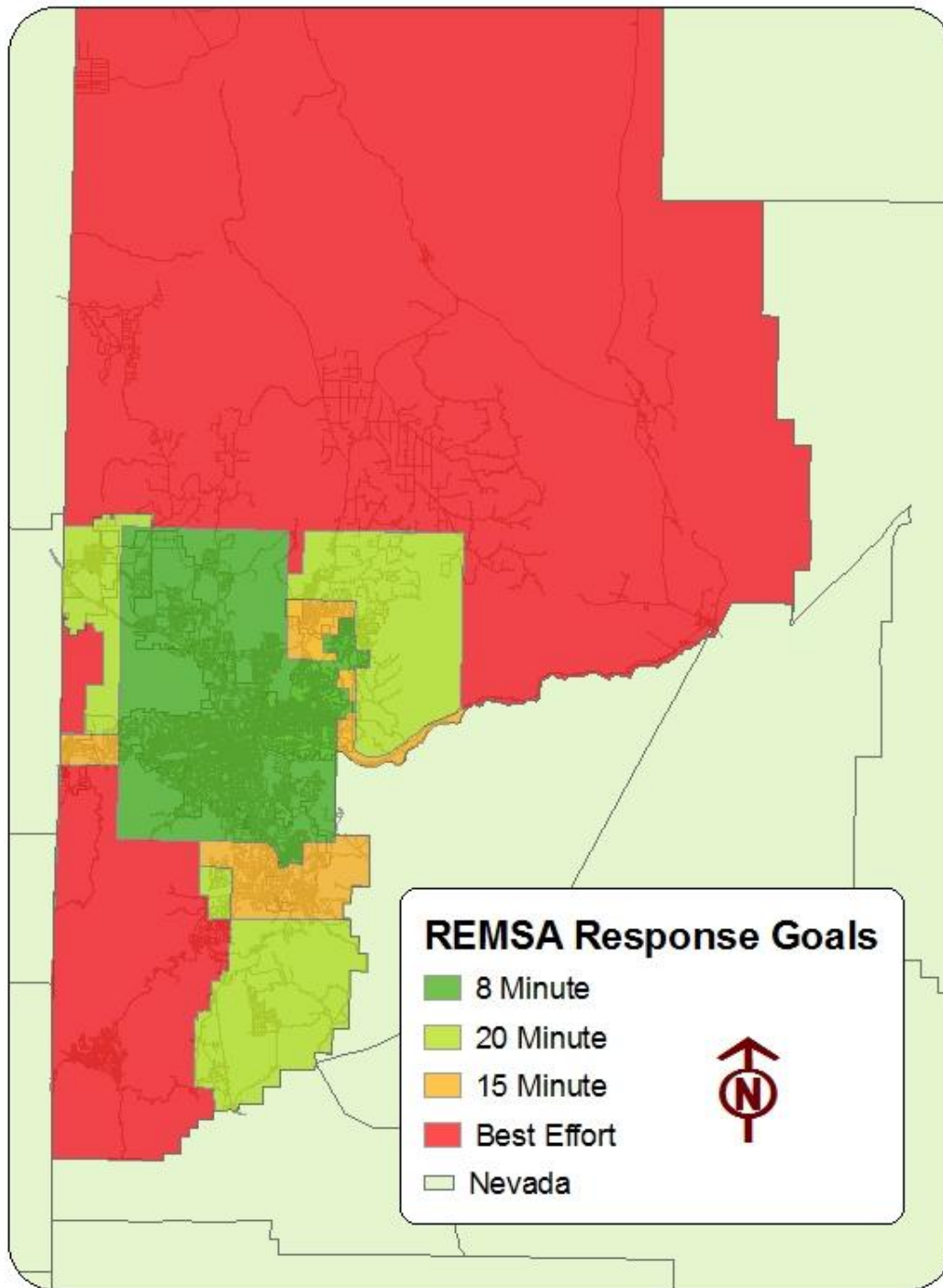
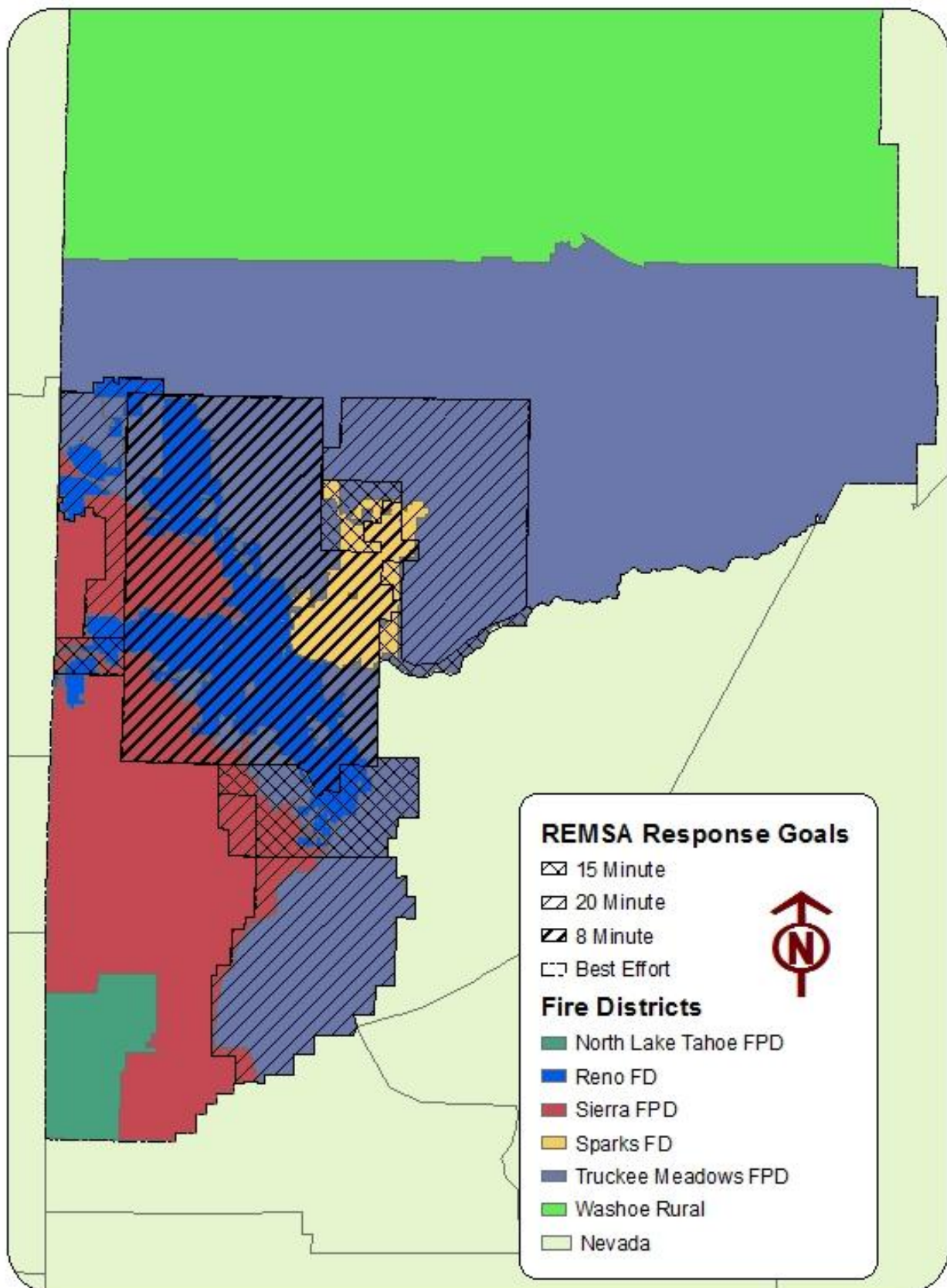


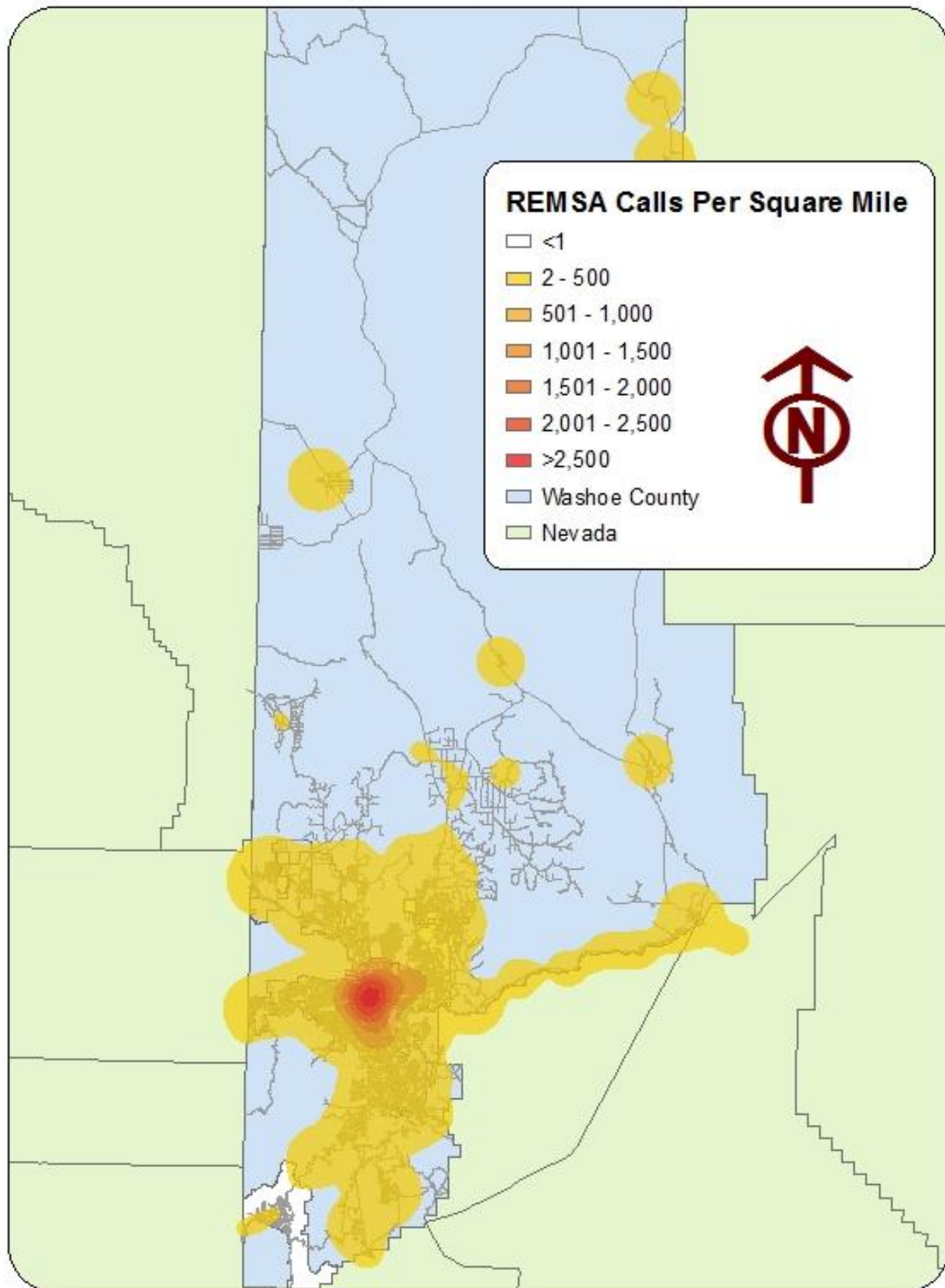
Figure 44: REMSA Response Goals and Washoe County Fire Protection Districts



Almost all of Reno Fire and the majority of Sparks Fire are within the 8 minute polygon. TMFPD and SFPD have areas within the 15 and 20 minutes polygons, but the majority of their areas (which are mainly rural or open space) fall in the Best Effort response area.

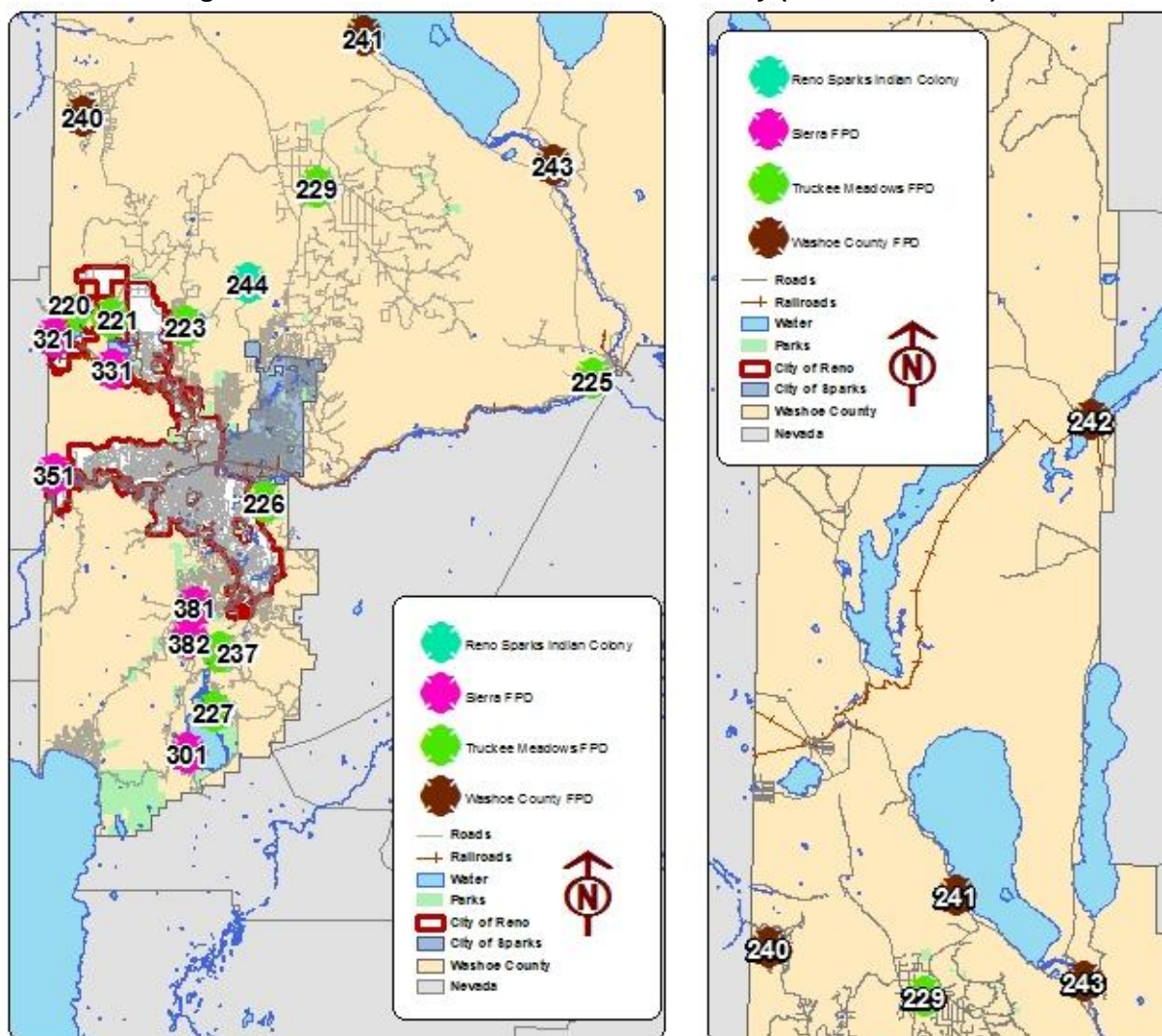
Most of REMSA's responses are in the cities of Reno and Sparks and most calls should be reached within 8 minutes total response time. The CY09 and CY10 CAD data included 87,682 unique emergency medical incidents, of which 78,684 (89 percent) geocoded. Using a density surface derived from the geocoded incidents, Figure 45 shows the density of emergency medical incidents per square mile.

Figure 45: REMSA Incident Density, CY09 and CY10



Volunteer Fire Departments – Volunteer fire departments are located throughout Washoe County. Since they are not primary first responders in their areas, an analysis of their call densities or coverages would be of little relevance. Figure 46 show the locations of the volunteer stations for southern and northern Washoe County. Given the call volume of Gerlach VFD (Station 242) which fields less than 1 call per day on average, additional stations are not recommended.

Figure 46: Volunteer Stations in Washoe County (South and North)



Summary

Based on current response times, call volumes and theoretical coverages, the response agencies in Washoe County are providing timely service for most residents. Although there are areas with response times above recommended goals, these should be viewed as opportunities to improve. Most improvements could be made by improving dispatch and response processes.

5. ASSESSMENTS BY EMS STAKEHOLDERS

As part of this study, and at the request of the county, an EMS stakeholder evaluation was conducted. Our purpose was to get their opinions on the current state of EMS in Washoe County, and its future course. The one group not represented in the focus groups was the citizens.

We based our evaluation protocol on the EMS Agenda for the Future, published by the United States Department of Transportation, National Highway Transportation Safety Division (NHTSA). The EMS Agenda for the Future identifies 14 attributes that are the basis of EMS systems.

- Integration of Health Services
- EMS Research
- Legislation and Regulation
- System Finance
- Human Resources
- Medical Direction
- Education Systems
- Public Education
- Prevention
- Public Access
- Communication Systems
- Clinical Care
- Information Systems
- Evaluation

In addition, we also referenced additional sources including: the DHS National Response Framework, the EMS Education Agenda for the Future, the EMS Scope of Practice document, the EMS Research Agenda for the Future and other pertinent documents.

Evaluation Process

We conducted the evaluation process by convening five separate constituent groups::

- **Chief Executive Officers** – Fire Chiefs, REMSA CEO, IAFF Rep, Sheriff, Hospital, and District Health Officer.
- **EMS Officers** – Fire Departments, REMSA COO, Health District EMS Coordinator, IAFF Representatives

- **EMS Medical Directors** – Fire Departments, REMSA, County Administrative Health Services Officer, At-large Medical Directors
- **EMS Dispatch** – Dispatch Centers, REMSA, Health Department, Medical Director, IAFF
- **Medical Community** – Hospital CEOs, Fire Chief, REMSA, Nursing,

Each evaluation process was held at the Washoe County Complex, in Building C, Room 110 and lasted four hours. We invited eight to 10 stakeholders from the identified constituent groups, but allowed anyone to attend any of the groups. The County Fire Coordinator also suggested some invitees.

The first three hours of each session were dedicated to system evaluation using the EMS Agenda for the Future attributes. The TriData project manager served as the facilitator, guiding the participants through each attribute, conducting a discussion, and asking each participant to determine a rank score. TriData team members assisted with facilitating discussions, clarifying issues, and explaining the intention of the Agenda for the Future. Individual scores were based on each participant's determination of Washoe County's EMS effectiveness for each attribute. The scoring guideline was as follows:

Table 13: EMS Assessment Scoring

Excellent	Washoe County has already achieved the attribute.
Very Good	Washoe County has either achieved or has plans to achieve the attribute.
Emerging	Washoe County has minimally achieved most of the attribute. A specific plan is needed to complete it.
Marginal	Washoe County has recognized what is needed to achieve the attributes but does not have a plan of action.
Unsatisfactory	Washoe County has not recognized this attribute as part of the EMS system.

Participants were issued a multi-page note-taking guide to use at their option. The guide's main purpose was to assist participants in preparing for subsequent discussions.

The last hour of the workshop included a facilitator- guided discussion to determine areas of improvement for each attribute. Participants offered ideas that were discussed among the group. The facilitation team took detailed notes for later evaluation. After each session, the participants' scores were calculated and analyzed using descriptive statistics. The facilitation team discussion notes were analyzed using qualitative statistics.

Results

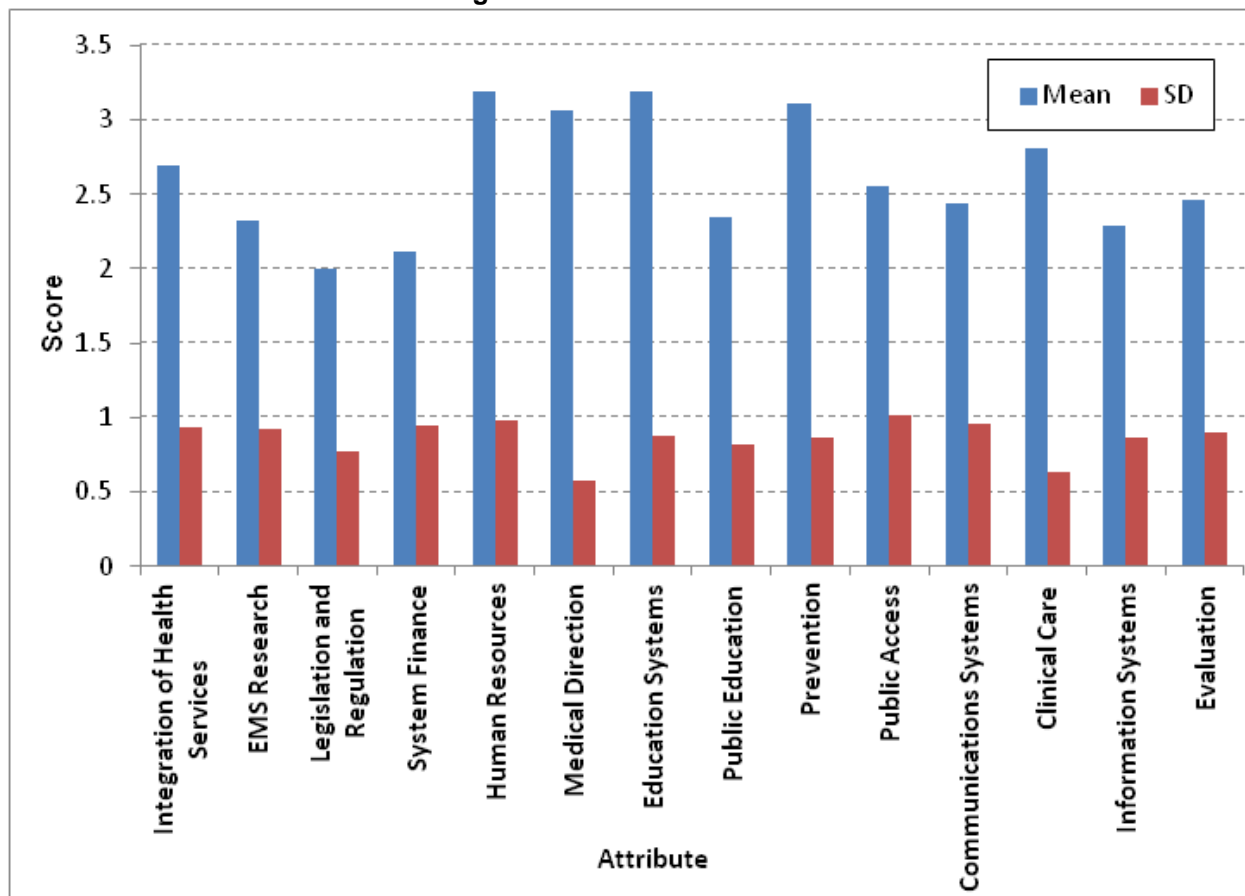
Following are the results for each constituent group and then the entire group.

EMS Chief Operating Officers – There were 19 participants at the session including: hospital executives, public health officials, fire and EMS chiefs, REMSA management, and law enforcement officials. Table 14 includes an evaluation of each EMS attribute by the participant constituents. St. Mary’s Hospital chose not to participate in the program.

Table 14: EMS CEO Evaluation

<u>Attribute</u>	<u>Mean</u>	<u>SD</u>	<u>Classificatio</u>
Integration of Health Services	2.69	0.93	Emerging
EMS Research	2.32	0.92	Marginal
Legislation and Regulation	2	0.77	Marginal
System Finance	2.11	0.94	Marginal
Human Resources	3.19	0.98	Emerging
Medical Direction	3.06	0.57	Emerging
Education Systems	3.19	0.87	Emerging
Public Education	2.35	0.82	Marginal
Prevention	3.11	0.86	Emerging
Public Access	2.56	1.01	Emerging
Communications Systems	2.44	0.96	Marginal
Clinical Care	2.81	0.63	Emerging
Information Systems	2.29	0.86	Marginal
Evaluation	2.46	0.9	Marginal
System Average	2.61	0.86	Emerging

Figure 47: EMS CEO Scores

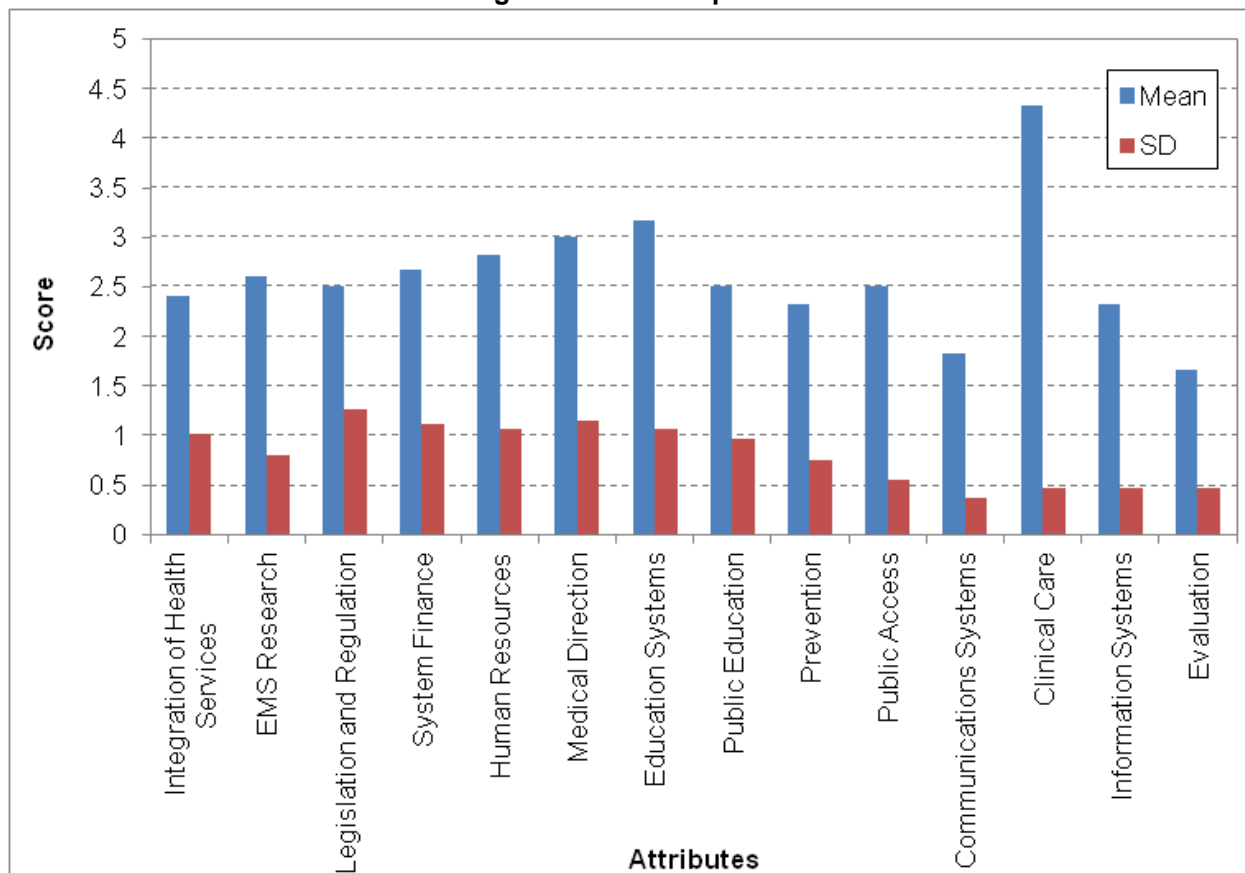


EMS Dispatch – Nine constituents from various EMS dispatch centers participated in the session. No representatives from Reno EComm attended or responded to our invitation. Table 15 represents scores for the constituents.

Table 15: EMS Dispatch

Attribute	Mean	SD	Classification
Integration of Health Services	2.4	1.02	Marginal
EMS Research	2.6	0.8	Emerging
Legislation and Regulation	2.5	1.26	Emerging
System Finance	2.67	1.11	Emerging
Human Resources	2.83	1.07	Emerging
Medical Direction	3	1.15	Emerging
Education Systems	3.17	1.07	Emerging
Public Education	2.5	0.96	Emerging
Prevention	2.33	0.75	Marginal
Public Access	2.5	0.55	Emerging
Communications Systems	1.83	0.37	Marginal
Clinical Care	4.33	0.47	Very Good
Information Systems	2.33	0.47	Marginal
Evaluation	1.67	0.47	Marginal
Overall Average	2.6	0.82	Marginal

Figure 48: EMS Dispatch



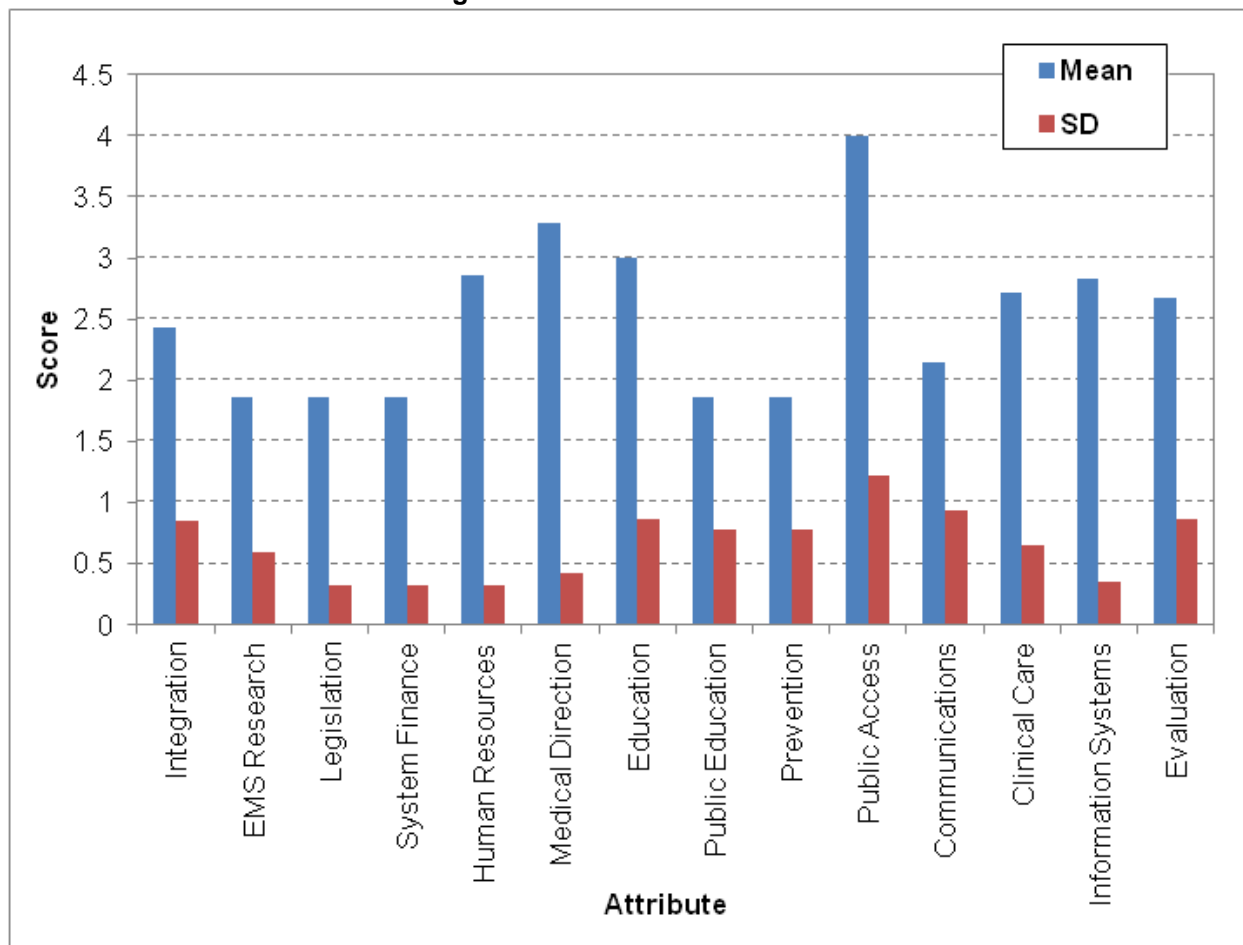
EMS Medical Directors – There was insufficient participation from the EMS Medical Directors to perform a valid assessment. The medical director from REMSA, North Lake Tahoe (half the session), and a local trauma surgeon were the only physicians to attend the session. Other system constituents were also present and everyone engaged in a meaningful conversation.

EMS Officers – Seven EMS Officers attended the session. These personnel were senior EMS officials for REMSA and fire department first responders. Table 16 and Figure 49 include the scores for the session.

Table 16: EMS Officer Session Ratings

Attribute	Mean	SD	Classification
Integration	2.43	0.85	Marginal
EMS Research	1.86	0.6	Marginal
Legislation	1.86	0.33	Marginal
System Finance	1.86	0.33	Marginal
Human Resources	2.86	0.33	Emerging
Medical Direction	3.29	0.42	Emerging
Education	3	0.87	Emerging
Public Education	1.86	0.78	Marginal
Prevention	1.86	0.78	Marginal
Public Access	4	1.22	Very Good
Communications	2.14	0.93	Marginal
Clinical Care	2.71	0.65	Emerging
Information Systems	2.83	0.35	Emerging
Evaluation	2.67	0.87	Emerging

Figure 49: EMS Officer Session



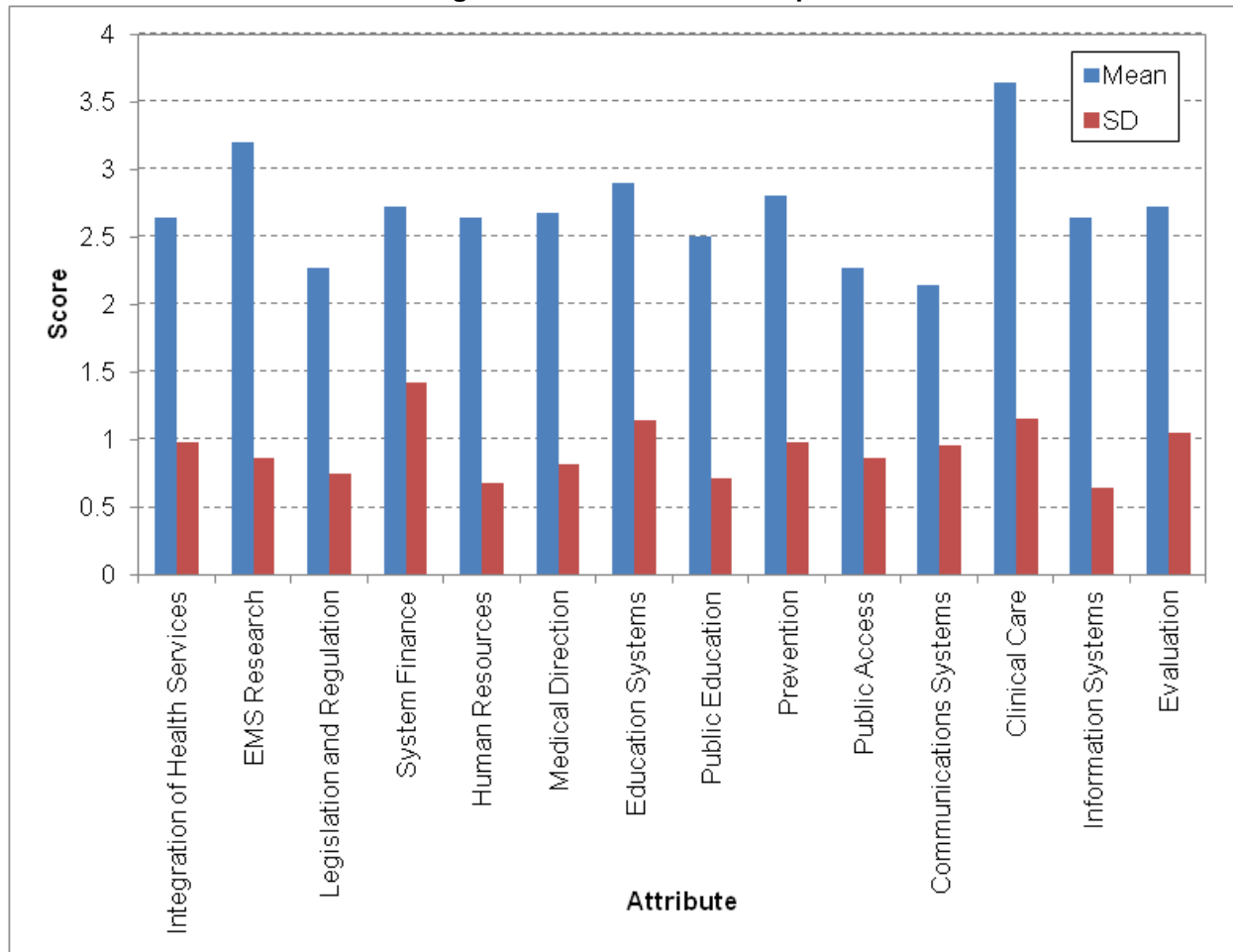
General EMS Community – There were 11 participants from the general EMS community that includes representation from the Washoe Health District, EMS educators, nursing, and community representatives. Table 17 and Figure 50 show the system evaluation for the group.

Table 17: General EMS Community

Attribute	Mean	SD	Classification
Integration of Health Services	2.64	0.98	Emerging
EMS Research	3.2	0.86	Emerging
Legislation and Regulation	2.27	0.75	Marginal
System Finance	2.73	1.42	Emerging
Human Resources	2.64	0.68	Emerging
Medical Direction	2.68	0.81	Emerging
Education Systems	2.9	1.14	Emerging
Public Education	2.5	0.71	Emerging
Prevention	2.8	0.98	Emerging
Public Access	2.27	0.86	Marginal
Communications Systems	2.14	0.96	Marginal

Attribute	Mean	SD	Classification
Clinical Care	3.64	1.15	Very Good
Information Systems	2.64	0.64	Emerging
Evaluation	2.73	1.05	Emerging
System Overall	2.70	0.93	Emerging

Figure 50: General EMS Group



System-wide Results

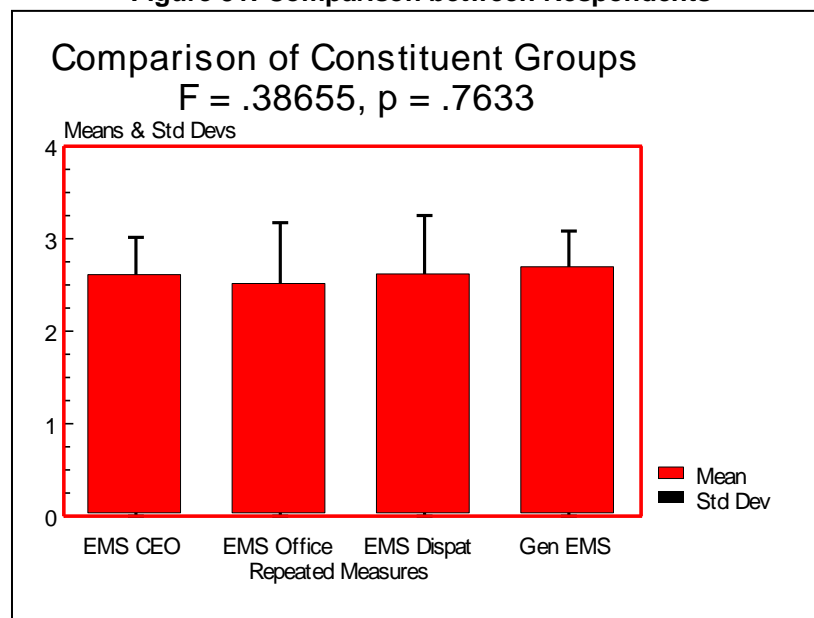
Table 18 shows the ranking of each attribute by each constituent group.

Table 18: Comparison of Constituent Groups

Attribute	EMS CEO	EMS Officers	EMS Dispatchers	General EMS	Mean	sd
Integration	2.69	2.43	2.4	2.64	2.54	0.11
EMS Research	2.32	1.86	2.6	3.2	2.50	0.43
Legislation	2	1.86	2.5	2.27	2.16	0.22
System Finance	2.11	1.86	2.67	2.73	2.34	0.33
Human Resources	3.19	2.86	2.83	2.64	2.88	0.18
Medical Direction	3.06	3.29	3	2.68	3.01	0.19
Education	3.19	3	3.17	2.9	3.07	0.11
Public Education	2.35	1.86	2.5	2.5	2.30	0.23
Prevention	3.11	1.86	2.33	2.8	2.53	0.42
Public Access	2.56	4	2.5	2.27	2.83	0.61
Communications	2.44	2.14	1.83	2.14	2.14	0.19
Clinical Care	2.81	2.71	4.33	3.64	3.37	0.59
Information Systems	2.29	2.83	2.33	2.64	2.52	0.20
Evaluation	2.46	2.67	1.67	2.73	2.38	0.38
Mean	2.61	2.52	2.6	2.70	2.61	0.06

Comparison of the groups, as seen Figure 51, revealed that there was no significant difference between or within the rankings of any group.

Figure 51: Comparison between Respondents



Although there was no difference between groups, by adding the scores from each constituent group, we determined the EMS community's strongest to weakest attribute. Clinical Care, Education, and Medical Direction were considered the strongest attributes, while Communications, Legislation, and Public Education were considered the weakest attributes. Table 19 shows the overall score for each attribute.

Table 19: Overall Evaluation of Attributes

Attribute	Score
Clinical Care	13.49
Education	12.26
Medical Direction	12.03
Human Resources	11.52
Public Access	11.33
Integration	10.16
Prevention	10.1
Information Systems	10.09
EMS Research	9.98
Evaluation	9.53
System Finance	9.37
Public Education	9.21
Legislation	8.63
Communications	8.55

Common Themes

After reviewing the scores of all constituent groups, we reviewed the comments concerning each attribute.

Integration of Health Services

- Successful integration on key (critical) services such as trauma, stroke, etc.
- Improvement with data sharing between all agencies.
- Unsatisfactory – Not transporting all patients to hospital
- Marginal – trauma, STEMI, stroke
- Emerging in integration of medical records
- Good integration fire/EMS/REMSA/ED
- Information sharing, common equipment, protocols, etc. are lacking

EMS Research

- Not as important at this point. There is great research published at national level that is integrated.
- Look at all options available.
- Very good use of external information.
- Individual efforts taken, not shared. This is higher level research.

Legislation and Regulation

- Need peer protection for a single EMS structure in Washoe Co.
- 2013 next legislative year. Need to take action soon.
- Who can REMSA transport to? QA committees and data sharing?
- Franchise agreement needs significant change.
- State EMS is emerging – County District Health Department is excellent.

System Finance

- Look at Fire response to medical calls vs. EMS overly response?
- Funding from private source back into system supported by tax dollars.
- Local taxpayer receives NO franchise fee or service offset from REMSA

Human Resources

- Adequate people/adequate interest. The right call at the right time in the right place.
- Great people, career path limited.

Medical Direction

- PMAC provides a good foundation. Needs more responsibility and authority/accountability to Dept. Health.
- PMAC
- No standard set for credentials of medical director.
- Some medical directors make large sums of money from other source.
- Very good PMAC
- Would vote for single medical director system-wide
- Segregated but good

- Fire Medical Direction is marginal – REMSA Medical Direction is excellent

Education Systems

- Good programs available. Accreditation at issue.
- National Registry standards
- Accreditation
- Good programs available

Public Education

- Organization and common education plan needed between agencies
- Programs in place from all EMS providers
- Cooperative program with all EMS providers

Prevention

- Organization and common education plan needed between agencies
- Programs in place from all EMS providers
- Cooperative program with all EMS providers

Public Access

- Need common PSAP/virtual integration via singular information systems and connectivity.
- Plan to consolidate
- Need same level of training (EMD, EFD) in 1 location countywide. Ideal would be regional center – all providers
- Need to have one center!
- Dispatch is broken!

Communication Systems

- Need common PSAP/virtual integration via singular information systems and connectivity.
- Need same level of training (EMD, EFD) in 1 location countywide. Ideal would be regional center – all providers
- All agencies need to be on 1 system.
- Dispatch is broken!

Clinical Care

- Need common oversight responsible for governance of all county EMS (REMSA + Fire + Police/sheriff)

Information Systems

- No commonality to medical record – health information exchange >5 years out.
- Need mutual AVL based system.
- Need regional AVL

Evaluation

- Need common oversight, direction and governance as clinical care. Qualified medical director organized under District Health. Lead PMAC. Responsible for the entire county. Great foundation to work with. Political lines and agendas are the challenge. The fact that we have all spent many hours in the same room for the past six months is clearly “will.” We just need leadership to show the way.
- More transparency.

Many of the recommendations we have made are based off of some of the common themes found from within these common themes.

6. WASHOE COUNTY DISTRICT BOARD OF HEALTH

Emergency medical services in Washoe County is composed of municipal, non-profit, and commercial agencies that provide specific services that should function as integral parts of the system. The Washoe County District Board of Health is the oversight agency for much of EMS system.

Washoe County District Board of Health

The Washoe County District Board of Health is the oversight agency for much of EMS. They have complete responsibility for the county ambulance provider, but little direct authority over first responder agencies. The DBOH vests day-to-day administrative oversight to the District Health Officer who is a physician, specially trained in public health administration.

The DBOH Emergency Medical Services Program strives to support the needs of the community for cost effective, expedient and quality ground and helicopter ambulance services and emergency medical care. EMS Program staff coordinates medical disaster planning, response and recovery activities before, during and after disasters within Washoe County. The District Health Officer and his staff represent the DBOH on local and statewide committees which include representatives from hospitals, ambulance services, fire, and law enforcement agencies. Staff members provide technical expertise to other agencies throughout the State as requested. The District Health Officer advises the DBOH on the public health impact of EMS policy decisions made within the three political jurisdictions of Reno, Sparks, and Washoe County. EMS staff members oversee medical disaster planning activities in support of the District Board of Health's Multi Casualty Incident Plan and Policy on EMS Coverage for Mass Gatherings, and the Medical and Weapons of Mass Destruction Annexes of the Regional Hazardous Materials Management Plan.

EMS was overseen by an EMS Coordinator until that position became vacant. In the interim, an Administrative Health Officer provided administrative coordination of the ambulance provider contract, and was assisted by various staff members. After appointment of the current District Health Officer, the EMS Coordinator position was filled, and an epidemiological specialist became the Division Director for Emergency Planning and Response, who oversees EMS. The District Health Officer is waiting for the completion of this study to put additional programs in place.

The DBOH has been granted specific authority from the City of Reno, City of Sparks and Washoe County to be the franchising agency for the ground and helicopter ambulance franchise the Board awarded to REMSA in 1987. The EMS Program staff assists the District Health Officer in monitoring REMSA's compliance with the franchise requirements. Franchise oversight is the main oversight role for the DBOH. There is little to no authority to regulate EMS

throughout the county. There is no countywide EMS medical director, and no intermediary between the state and individual first responder agencies.

We believe that greater county oversight is needed to assure quality EMS care. The current EMS system really functions as several sub-systems with little oversight between individual services and State EMS. The DBOH, or other county-level agency needs greater oversight authority. Accountability for not only system performance, but also individual service level performance, is limited at best. The only service that must meet certain performance standards is REMSA. These are well defined in the contract, and consequences are clear. None of the other EMS services operating within the county have defined performance standards, and as a result accountability does not exist. This lack of uniformity adds to the distrust among provider services.

In subsequent chapters, we will discuss this in greater detail.

Multiple/Mass Casualty Incidents – The DBOH is also responsible for initiating and updating a Multiple/Mass Casualty Incident Plan. The current plan is a working document and is evolutionary in nature. The last update was in 2008.³⁰

The Washoe County Multiple/Mass Casualty Incident Plan has recently been used for significant incidents. Within the last year, the Multiple/Mass Casualty Incident Plan was used to manage a multi-casualty air race incident and the medical branch for the area mass wildland fires. The community consensus is that the plan has been successfully implemented and that EMS providers work well with it.

There are other emergency management documents that are part of the DBOH and the Department of Health including an evacuation plan and special incident plans. While the DBOH provides administrative oversight, operational direction is provided by local public safety agencies using the National Incident Management System (NIMS).

Health District Internal Report

Currently, the Washoe County Health District produces an annual report to determine if REMSA is in compliance with their franchise agreement. Frankly, this report is of little value because it only reports on a yes/no basis whether the minimum standards are met. This report must provide a more significant, objective measurement of REMSA's performance, and not a valueless effort at not measuring anything. In the future, this report should include a detailed measurement of metrics from throughout Washoe County.

³⁰ Washoe Health Department. (2008). *Washoe County District Board of Health Multi-Casualty Incident Plan-Revised*. Washoe County Health Department.

An effective report should include metrics for all response times on all calls. Skills proficiency for all measurable skills, outcome data for patients, especially those treated under special programs such as STEMI, Stroke, trauma center referrals, and financial information. Protocol variations should be tracked and a summary of investigation outcomes should be provided (within HIIPA guidelines). The annual report should include a list of EMS providers that are granted EMS functional privileges at all levels.

The DBOH believes that the current system is very effective. The combination fire first response and REMSA paramedic/ transport system is functioning well.

7. EMERGENCY MEDICAL SERVICES – A PROPOSED SYSTEM OF CARE FOR WASHOE COUNTY

Here we will present a suggestion for the overall EMS system in Washoe County. First, a little history and philosophy on EMS.

History of EMS

The history of the evolution of EMS in the United States is well- chronicled. EMS has evolved from mortuary based transports, to complex, comprehensive, and integrated systems of care. In spite of this development, there is no clear consensus or agreement on the definition or structure of the ideal EMS “model.”

Experts, when asked to define various models around the country, use different terminology, features, and attributes to describe their particular model. Terms used to describe models often include, paid/volunteer, fire-based, public utility, third service, hospital based, private, primary service area, tiered response, open competition, subscription, mixed/combination, as well as many other regionally specific terms. None of these descriptors or definitions share all the same underpinnings and clearly mean different things to different managers. Many of these terms often called models or systems, are actually attributes. There is no agreement on what the ideal system is or should be. Some believe that the perfect EMS model is simply elusive and will never be achieved.

As early as 1973 with the publication of the Emergency Medical Systems Services Act of 1973, it was nationally recognized that there was a need for a systematic approach to the delivery of EMS and defined 15 system components. The Act defined an EMS system as a system which provides for the arrangement of personnel, facilities, and equipment for the effective and coordinated delivery in an appropriate geographical area...and which is administered by a public or nonprofit private entity which has the authority and the resources to provide effective administration of the system.³¹

In 1988 The National Highway Traffic Safety Administration developed the Statewide EMS Assessment Program establishing ten operational benchmarks for system performance.³² And more recently National Highway Traffic Safety Administration developed the EMS Agenda for the Future that not only reinforced the systematic approach to the delivery of EMS but also stressed the need for further integrating EMS within the social services and

³¹ Emergency Medical Services Act of 1973: Public Law 93-154, Title XII of the Public Health Services Act, Washington, D.C., 1973.

³² Statewide EMS Assessment Program; National Highway Traffic Safety Administration, Washington D.C.

public health continuum. The agenda included fourteen attributes for future system development. These programs clearly defined the need to develop systems that are integrated, linked, comprehensive, and include a lead EMS agency with clear authority to manage assets in the geographically defined area.

The changing face of emergency medical services and healthcare gives the manager the opportunity to develop a system that meets the needs of the community it is intended to serve. Models that are often viewed as familiar are becoming obsolete as EMS is integrated into the healthcare system, as described in the EMS Agenda for the Future. New opportunities to adjust systems based on features and attributes, not historical models, abound. There is not one ideal system, nor can a cookie cutter approach be used.

Developing a “Best” System for Washoe County

The best system for Washoe County needs to be based on a combination of Washoe County resources, the District Board of Health, County attributes, County commitment, and the needs, expectations and resources of the Washoe County community.

EMS in Washoe County is somewhat unique because the delivery of EMS consists of several different types of components attributes: non-transport, fire-based EMS services (career and volunteer), a transport volunteer based service, a transport fire-based EMS service, and the Regional EMS Authority (REMSA), an essentially private ambulance service. While this service is referred to as a Public Utility Model (PUM), the relationship of the Board of Director to the service itself, more closely resembles a traditional private service with an exclusive franchise agreement and held to certain performance standards.

Additionally, other components include Reno EComm, a city-county based Public Safety Answering Point (PSAP), the incorporated City of Sparks Fire Department municipal based PSAP; a dispatch center as part of REMSA, and the Washoe County Sheriff's Office Dispatch. Communication resources include an 800MHZ Nevada Shared Radio System (NSRS), trunked radio system used by virtually all public safety agencies, with the exception of REMSA that continues to use a legacy UHF radio system and is the exclusive user of that system.

Receiving facilities include Renown Health, an American College of Surgeon verified high volume Level II Trauma Center, Northern Nevada Hospital, and St Mary's providing comprehensive emergency departments. These receiving facilities are geographically located throughout the City of Reno. A smaller hospital serves the North Lake Tahoe/Incline area providing emergency care and some inpatient services.

As early as 1973 with the publication of the Emergency Medical Systems Services Act of 1973, the Country recognized that there was a need for a systematic approach to the delivery of EMS and defined 15 system components. The Act defined an EMS system as a system which provides for the arrangement of personnel, facilities, and equipment for the effective and

coordinated delivery in an appropriate geographical area...and which is administered by a public or nonprofit private entity which has the authority and the resources to provide effective administration of the system.

In 1988 The National Highway Traffic Safety Administration developed the Statewide EMS Assessment Program establishing ten operational benchmarks for system performance. And more recently National Highway Traffic Safety Administration developed the EMS Agenda for the Future that not only reinforced the systematic approach to the delivery of EMS but also stressed the need for further integrating EMS within the social services and public health continuum. The agenda included fourteen attributes for future system development. These programs clearly defined the need to develop systems that are integrated, linked, comprehensive, and include a lead EMS agency with clear authority to manage assets in the geographically defined area.³³

EMS System for Washoe County

There are several options to consider in designing a workable, county-wide EMS system. Regardless of the methods chosen, each will require the passage of county legislation to authorize the DBOH to have greater system oversight authority.

Need for Lead Agency – Washoe County, in spite of several remarkable attributes, does not operate a comprehensive, coordinated and integrated EMS system. Many Washoe County stakeholders identified this as a major issue in the delivery of EMS services, and described Washoe County as having five subsystems. There is no clear lead EMS agency that has oversight over the entire system. The program is fragmented with delivery services, operating as independent providers, resulting in little accountability. Data and Information are not shared freely among the services, providing for significant response inefficiencies, as well as distrust among providers. These ineffective relationships require transferring of call data that increase response times. Medical direction is fragmented and although each provider service has a local medical director, the Prehospital Medical Advisory Committee (PMAC) was reported to be ineffective because it is advisory and has no authority to make decision across the system causing variable protocols and inconsistent delivery of care. Medical direction is not inherent in all facets of the program.

³³<http://www.nhtsa.gov/About+NHTSA/Traffic+Techs/current/Emergency+Medical+Services+System+Development+1995+Update+of+the+Statewide+EMS+Assessment+Program+Through+1994>

The lack of a comprehensive integrated countywide EMS system makes it difficult if not impossible to address the economic challenges that face Washoe County. An effective system will allow for the removal many of the mechanical inefficiencies that cannot be addressed under the current configuration, thereby improving the service and reducing the overall cost of the delivery of care.

One method to consider is adding county oversight into the current model. The DBOH would enable the District Health Officer to create and oversee a staff of professionals. Figure 52 describes the structure keeping the REMSA Board.

Note: The DBOH could also be a Washoe County agency, and the DHO could be a Washoe County EMS Manager.

Recommendation 5: Create a lead EMS Agency, under the District Board of Health (and County Health Officer) to provide oversight over the entire EMS system, while maintaining the organizational identity of the individual provider services. This system should include a county EMS Manager, EMS Medical Director, and sufficient staff to provide regulation and oversight of access, clinical care, administration, quality management, education and training, disaster management, and evaluation. All organizations from PSAPs to healthcare systems that provide EMS in Washoe County should be part of the county-wide system.

There are several options to consider in designing a workable, county-wide EMS system. Regardless of the methods chosen, each will require the passage of county legislation to authorize the DBOH to have greater system oversight authority.

DBOH Oversight Within the Current Structure – One method to consider is adding county oversight into the current model. The DBOH would enable the District Health Officer to create and oversee a staff of professionals. Figure 52 describes the structure keeping the REMSA Board.

Figure 52: DBOH EMS Oversight Using Current Structure

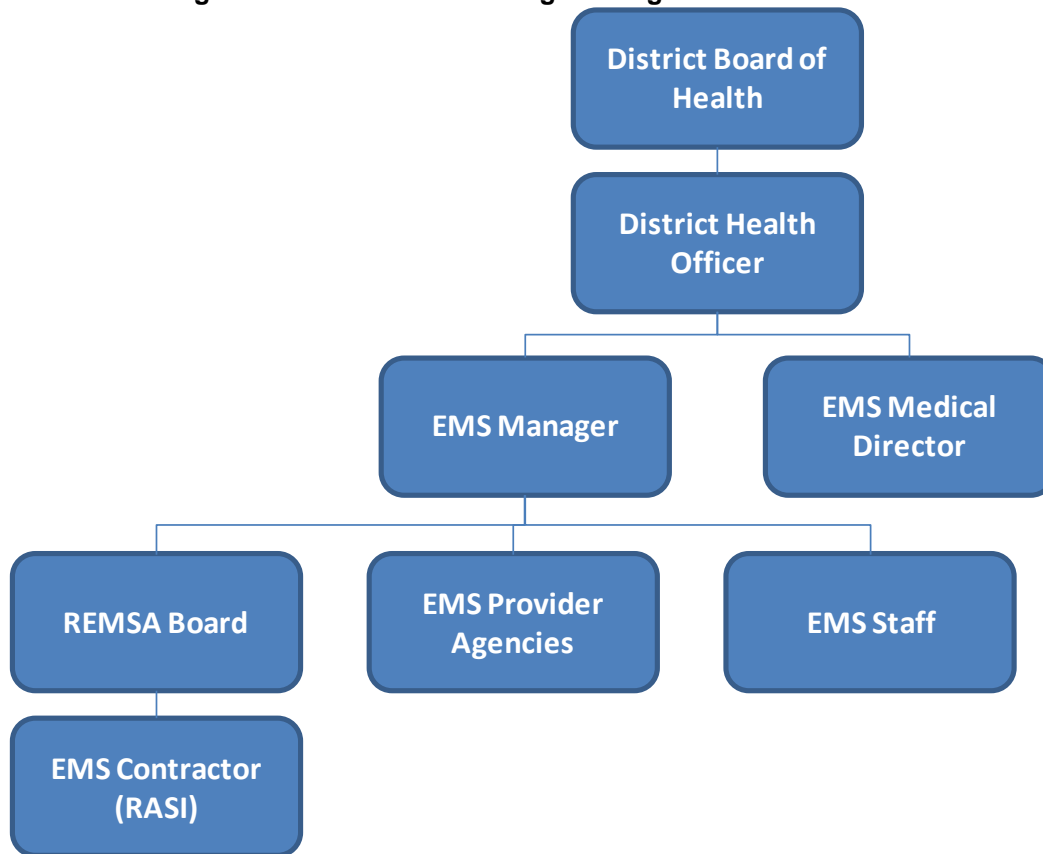
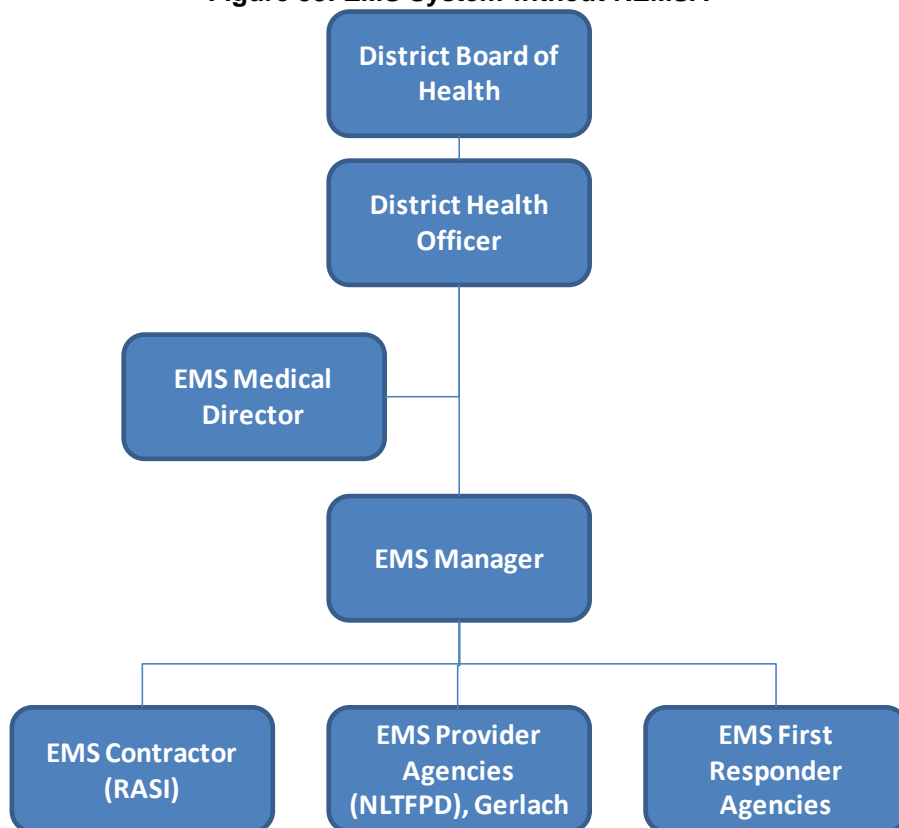


Figure 53 shows the county-based administrative oversight system without REMSA. The contractor would report directly to the EMS Manager.

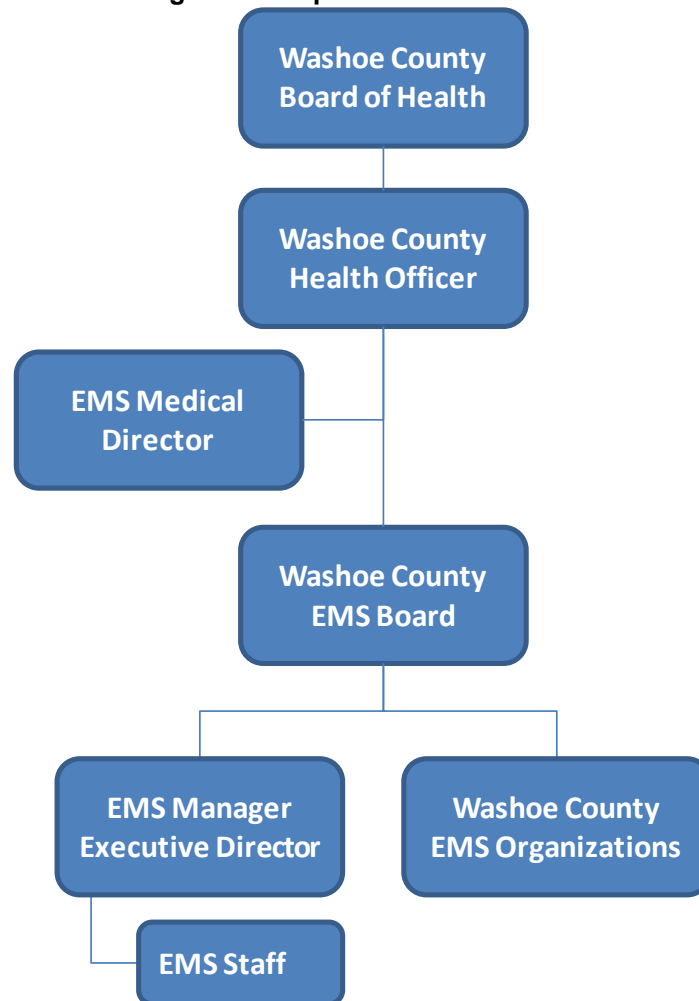
Figure 53: EMS System without REMSA



Another consideration could be to use the oversight board approach, but expand its oversight to the entire system. The board would be made up of independent, county-appointed individuals, some representing certain organizations, while others representing the citizenry. The EMS Manager would serve as the board executive director, and the medical director would be ex-officio.

This type of system is fraught with many complications, including member independence, time needed for members to conduct business, and the tendency for non-board officials to be delegated power out of convenience. Controlling these variables could make this model workable. Figure 54 shows the expanded board model.

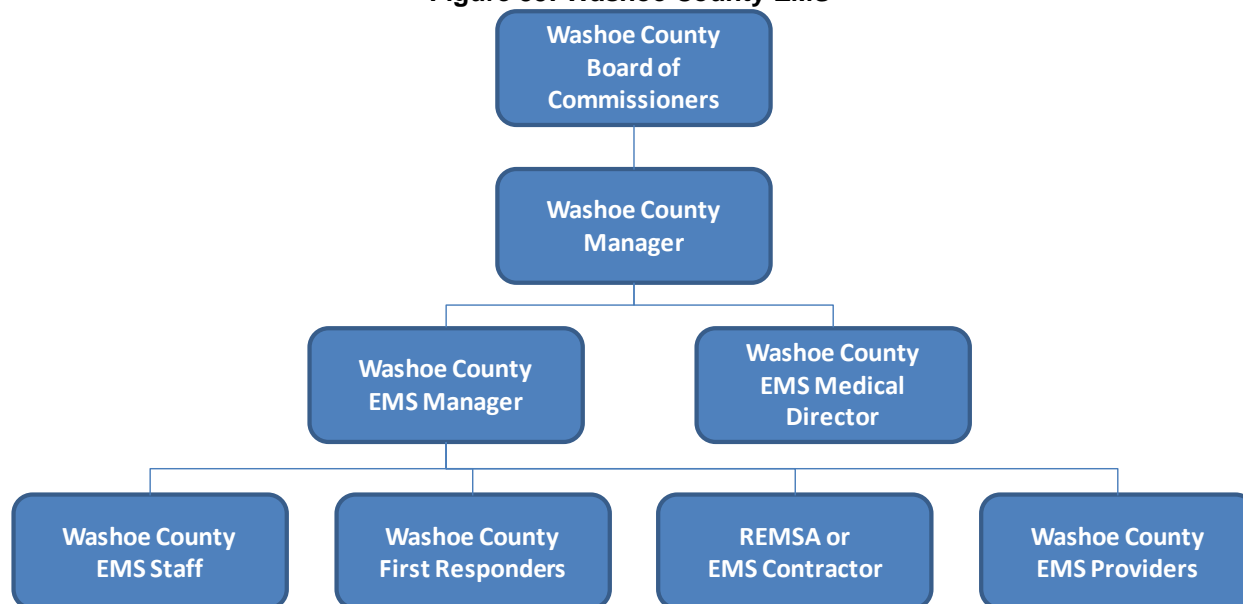
Figure 54: Expanded Board Model



In any of these EMS models, a qualified, full-time physician medical director could fill both the EMS Medical Director, and EMS Manager positions. If this route is chosen, the physician must have experience and education in EMS management.

Alternatively, the same oversight could be provided by another Washoe County agency including a lead fire or public safety agency. Figure 55 shows an alternative structure.

Figure 55: Washoe County EMS



Recommendation 6: Create a lead EMS Agency, under the District Board of Health (and County Health Officer) to provide oversight over the entire EMS system, while maintaining the organizational identity of the individual provider services. This system should include an EMS Manager, EMS Medical Director, and sufficient staff to provide regulation and oversight of access, clinical care, administration, quality management, education and training, disaster management, and evaluation. All organizations from PSAPs to healthcare systems that provide EMS in Washoe County should be part of the county-wide system. Alternatively, oversight could be provided by another Washoe County public safety agency.

Costs of a County EMS System – Unfortunately, expanding county EMS oversight will involve an investment in additional personnel. Several of the positions already exist in the Washoe County Health Department. Some can be offset by charging fees to provider organizations. This is unpopular but may be needed. The performance fines paid by contractors could be used to finance the system. First responder agencies may have to be assessed penalties for failure to maintain response time standard. The county must be cautious in using penalty funds as a means of fundraising. Monetary penalties are used to encourage system constituents to meet their contractual obligations. System integrity becomes compromised or at least questioned when the system is financially based on fines.

Several years ago, Washoe County eliminated any fees paid by cities or districts for ambulance service. This was an appropriate action. Under no circumstances should a contracted EMS provider be provided a government subsidy, or stipend to provide service.

Recommendation 7: Under no circumstances should the county, any city, or any fire protection district agree to provide an EMS contractor a government subsidy, or stipend to provide service.

EMS Medical Direction

The role of medical direction in EMS systems has been well described and documented. Both the EMS Agenda for the Future and NHTSA Statewide EMS Assessment Program the clearly identify the role of the medical directors.

EMS is a medical care system that involves medical practice as delegated by physicians to non-physician providers who manage patient care outside the traditional confines of office or hospital. As befits this delegation of authority, the system ensures that physicians are involved in all aspects of the patient care system.

Nevada EMS Requirements – Consistent with this benchmark, Nevada Administrative Code NAC 450B.505.1b requires a medical director for each service providing emergency medical care, including volunteer and first response fire services, and clearly defines the roles and responsibilities of the service medical director. All services in Washoe County have medical directors. The level of involvement in their particular service varies. Some services have medical directors with broad and extensive national experience in the field of medical direction and are extensively involved while others have medical directors that have limited experience in EMS delivery and are minimally involved. NAC 450B does not require that EMS medical directors be board certified emergency physicians, nor that they have certification as a EMS Medical Director, but only that they have a knowledge on EMS.

As a result of the broad variation of experience as EMS Medical Directors, some programs have medical directors that are involved in all aspects of the delivery of care, including training, quality assurance, dispatch, treatment protocol development, transportation protocol development and other aspects of the delivery of care. Others are limited to provider certification and verification. System stakeholders reported that some rarely see or interact with their medical director while others see and interact with him/her on a daily basis. Such inconsistently typically leads to variability in the provision of care throughout the system. Two of the medical directors in Washoe County did not participate in the evaluation, nor did they answer emails or phone calls.

Prehospital Medical Advisory Committee – All service medical directors have a seat on the Washoe County Prehospital Medical Advisory Committee (PMAC). This committee serves as a communications forum and participation is voluntary, and is advisory in nature. The PMAC has no delegated authority and as a result little has been accomplished to enhance either the medical involvement in the system or enhancement to the system. Some representatives reported that only three or four medical director participate in the quarterly meetings. The PMAC has bylaws, but lacks goals and objectives, lacks a defined custodian of records, lacks a chairman, and lacks authority to make system enhancements. Other than information exchange, most felt that the PMAC is not being used to potential. In the past a Medical Control Board existed with authorities vested by the State, but due to the revision of NAC 450B, which

retracted certain authorities to the State EMS Office, that Board was abolished and replaced with the PMAC. Medical Directors reported that this format was effective and better served the community than the current PMAC.

The exception to this is the development of countywide treatment protocols. Recently, several medical directors and EMS system leaders have started meeting with the mission to create a countywide EMS treatment protocol.

System Medical Direction – There is no “system” medical director to provide consistency of medical oversight, and medical decisions that affect the entire system are generally consensus by committee with no authority for implementation. This appears to be a reflection of the fact that Washoe County EMS is fragmented and operates as if it were five subsystems without a lead agency with ultimate authority for the system. This lack of cohesion makes decision making difficult and consistency throughout the system problematic, ultimately reflecting in the quality of care.

Online and offline medical direction is available in Washoe County but is used on a limited basis when requested by responders. Receiving facilities have 800MHz radios as well as the UHF radios used solely by REMSA. The use of two distinct radio frequencies, while providing communication redundancy, has created communications problems. Some receiving facilities reported that they do not monitor the 800MHz system with regularity. There does not appear to be a groundswell for increased online medical direction, but the option should be available, especially as EMS programs are enhanced.

In addition to prospective and contemporaneous activities, medical directors have critical prospective, concurrent and retrospective roles in the area of quality management. Washoe County stakeholders reported strong physician involvement in some local quality management programs.

There was a serious concern regarding the protection of quality management information when it involved reviewing cases where more than one service provider was concerned. State law does not provide protection from discoverability or other legal protections for such collegial quality management or evaluation reviews. It is unclear if the State provides ‘any’ legal protection from discovery of peer-review information generated as part of evaluation efforts. Such limitations severely limit the county’s ability to conduct effective quality improvement reviews of mass casualty events or other major incidents where more than one service provider is involved. As a result they do not occur in any meaningful way. This also leads to the cloud of mistrust that is pervasive among the county EMS providers.

We discussed this matter with the Nevada State EMS representatives and found no evidence to support or refute the inability of the EMS system to conduct traditional medical peer-reviewed case reviews. This includes either within organizations or between organizations. The presumed loss of protection from discovery is not directly rooted in law, but possibly urban

legend. The recent NHTSA State EMS Assessment does not mention this as a quality management issue. Regardless, state or county legislation or administrative regulation may be necessary for all parties to be willing participants in system-wide EMS quality management activities.

Recommendation 8: The DBOH should be given the authority to, and appoint an EMS Medical Director with oversight and authority over the quality of care for the entire system. The EMS Medical Director would report to the District Health Officer, and could be a classified or contracted employee.

Recommendation 9: Work to assure the passage of legislation or administrative regulation providing legal protection to all constituents participating in local EMS quality management programs.

Qualifications for an EMS Medical Director should include:

1. Current license, in good standing, by the State of Nevada as a Medical Doctor (MD) or Doctor of Osteopathy (DO).
2. Current certification by the American Board of Emergency Medicine or the American Board of Osteopathic Emergency Medicine in the specialty of Emergency Medicine.
3. Certification or Eligibility in the Sub-specialty of EMS is preferred.
4. Documented experience in providing EMS Medical Direction.
5. Able to meet the current requirements for an EMS Medical Director as per the Nevada State Office of EMS.
6. Continue to monitor the recommendations from professional organizations including, The American College of Emergency Physicians (ACEP), the American College of Osteopathic Emergency Physicians (ACOEP), the American Academy of Emergency Medicine (AAEM), and the National Association of EMS Physicians (NAEMSP).

Recommendation 10: Accept the listed qualifications for the position of County EMS Medical Director.

EMS Medical Direction Task Force – The PMAC should be redesigned as the EMS Medical Direction Committee with the primary goal of advising the County EMS Medical Director and County Health Officer on matters that concern all phases of EMS care.

Task Force Composition: The task force should be chaired by the County EMS Medical Director, with representation from three main constituent groups.

- **Provider EMS Medical Directors** – These are the medical directors from each first responder, ambulance, and aeromedical provider agency. The District Health Officer may appoint specialists in emergency medicine and trauma surgery to serve on the task force.

- **Medical Specialty Advisors** – These are community physicians from specialties that are not usually involved in day-to-day EMS, but would be available to provide consultation for specific EMS situations involving their specialty. Examples would include specialists in dermatology, infectious disease, ophthalmology, otolaryngology, psychiatry, etc. They are not regular task force members.
- **Non-physician EMS Clinical Leaders** – These include distinguished representatives from non-physician medical specialties including EMS (including the fire service), nursing, and others whose expertise will contribute to the quality of EMS care.

Task Force Purposes: The EMS Medical Direction Task Force will provide advice to the County EMS Medical Director regarding areas including EMS protocols (including, all levels of Medical Priority Dispatch, Emergency Medical Technician, and Paramedic), EMS education and training, quality management, expanded scope of EMS service and practice, and matters concerning any of the 14 EMS Attributes.

The Task Force itself would remain advisory in nature, but with the County EMS Medical Director chairing the task force, its advice is more likely to be implemented. There is no intention for the task force to limit the authority of the EMS Medical Director or the District Health Officer.

<p>Recommendation 11: Rename the PMAC as the EMS Medical Director Task Force to be chaired by the County EMS Medical Director. The task force would be advisory in nature.</p>

8. INFORMATION SYSTEMS

Because of the episodic nature of EMS, the various data element needed to evaluate systems performance and the care delivered are collected in disparate locations, and by various components of the system. Required Data elements for a comprehensive information management system are stored in various CADs, 9-1-1 logging recorders, and radio system(s) logging recorders. For injury and illness surveillance, trauma registries, emergency department registries, traffic records and other data sets must also be available. The ability to collect, link, and analyze EMS data was identified in the *EMS Agenda for the Future* as the "...very foundation of the future of EMS."³⁴ It has been over 10 years since information and data management was identified as an essential need for future EMS systems. The Government Accounting Office (GAO) has since identified that most agencies see this as a goal, its progress has been slow, and the goals have not been accomplished.³⁵

In Washoe County, the management of EMS information is one of the weakest link that we noted. Washoe County has no central repository for EMS communications, reporting, or system data. There is little cohesion between prehospital and hospital follow-up, or data are available not shared. Complicating the problem is the lack of an integrated and cohesive EMS system to provide a platform for effective data collection. There are several CADs being used by different agencies which are not linked. Some services have comprehensive Records Management Programs, while others have rudimentary programs. To effectively measure response interval and performance, clocks for each data collection device must be synchronized. Unique patient identifiers must be in place to track patients through the system. This is not taking place. As a result it is impossible to accurately measure system performance. Washoe County EMS agencies are protective of their data, and are not willing to freely share data elements among stakeholders. Not only has this prevented effective measurement of system performance and productive health surveillance, it has created an environment of distrust. This distrust was exhibited not only among EMS system stakeholders but between the public and the EMS community.

This systemic distrust appears to result from two elements. First the perceived notion that REMSA does not openly and freely share all data elements that it collects with other system stakeholders. Second the perceived notion that the information generated from the data is inaccurate. Third, fire services want to become the exclusive EMS provider within the county.

³⁴ EMS Agenda for the Future. Washington, DC : U.S. Dept. of Transportation, National Highway Traffic Safety Administration, [1996] p. 55

³⁵ IOM. (2007). *Future of emergency care: Emergency medical services at the crossroads*. Washington, DC: Institute of Medicine.

These barriers must be eliminated in order to provide an effective foundation for meaningful data collection and interpretation.

The Washoe County citizen has a different perspective on what the data means than the EMS, communications, or facility system manager. The citizen only cares about how long it takes to get an ambulance to his location from the time he calls 9-1-1, not the individual intervals. The citizen deserves and demands an accurate report of that event. The Communications manager focuses on call processing and dispatch times. How long it takes the call taker to process the call and dispatch the resource. The EMS manager focuses on the time EMS gets the call until the unit is back in service: how long it takes the responder to turn out, travel to the location, scene time, travel time to the hospital, time in hospital, and time to in service. There are specific recognized call intervals that system managers study to evaluate system performance each reflecting on a specific performance element or interval. Washoe managers can only improve performance and trust if they study and repair those response intervals, and that common standards exist for each. Fundamental is the ability to effectively measure each interval both individually and in aggregate. To accomplish this, data elements must be available, valid and accurate.

Because of the lack of a comprehensive integrated EMS system for Washoe County, there is not clear information management program and continuum. Reno ECOMM and Sparks FD collect dispatch interval data. REMSA and Sparks FD collect response data. First response agencies collect response data. Clocks are not synchronized. Yet data are not collected in an integrated and aggregated fashion. Because there is transfer function where ECOM call takers hand EMS calls off to REMSA for dispatch, there is a mechanical inefficiency and delay that is built in to the dispatch function. Two 9-1-1 centers and three dispatch centers provide duplicity of effort and inconsistent data collection.

One of our biggest frustrations was the acquisition of data from Dispatch centers, especially Reno EComm. It took several months into the study to secure analyzable data. Dispatch facilities should be able to quickly assess and report on response, and other performance data.

REMSA and WCSO have RMS systems that allow for Automatic Vehicle Location through Marvlis® and similar police software respectively. The remainder of the provider agencies either (a) do not have an RMS that allows AVL or (b) do not have mobile data terminals that can receive the data. As a result, there is no way to accurately measure the EMS response continuum. Effective use of AVL technology does not exist and the use of closest forces dispatch principles cannot be implemented system-wide.

Improvement in data collection and system performance enhancement can only take place if certain system structure changes occur. Consolidation and integration of dispatch/9-1-1 centers will provide a singular source for response data. A central data collection function and

information manager who has access to all data in the system will allow for valid, reliable, accurate and timely response and performance data. While REMSA and WCSO have implemented Record Management Systems (RMS), most interpret Computer Aided Dispatch (CAD) data using Chrystal Reports which can provide basic information, but not the robust information provided by RMS and required for efficient system monitoring and measurement.

It is difficult to recommend a full consolidation of 911 Centers because the most efficient center (Sparks) would likely be absorbed. Instead, the county should consider a *virtual consolidation* of 911 Centers, where regardless of physical location, all CADs and data management systems would be connected. AVL services would be accessible to fire and EMS agencies to determine locations and availability of units.

In addition to EMS specific response and performance data, managers must be able to link EMS data with other public health, public safety, and community resources. Traffic safety records, Renown Health trauma registry, public health, and emergency department registries, are examples of data sets that should be accessible and linked. Available data provides a basis for research and health care surveillance. EMS stakeholders reported that it is easier to participate in national research activities than in local Washoe County efforts. This is reflective of the lack of trust among EMS agencies in what some consider proprietary data. To participate in meaningful local EMS evaluation and research and injury and illness surveillance, these trust barriers must be removed.

Recommendation 12: Within the Washoe County District Board of Health (or selected lead EMS agency), create a data management program to generate valid, reliable, accurate, and timely information to describe the entire EMS event for the county and provide real time feedback to response agencies and the community. Cooperate with other public health and public safety and community resources to produce injury and illness surveillance reports that can be used to focus EMS efforts.

A Word About Proprietary Data

REMSA and other agencies are concerned about data security and unauthorized access. Since REMSA and its contracted agents are proprietary entities, some of their concerns are valid. For example, unauthorized access to files containing ambulance placement and staffing methods could lead to financial losses. In contrast, outcome data concerning response times, patient care (unless HIPAA restricted), provider services, and similar data are public and should not be subject to protection under proprietary restriction. While ambulance response time compliance is not proprietary, the models used to determine ambulance placement are likely proprietary.

Recommendation 13: Combine 9-1-1/dispatch centers into one central county-wide resource so that all data is collected in one central location with singular methodology. Alternatively, develop a virtual consolidation between dispatch centers using a universal CAD or type of CAD for the county.

Recommendation 14: Implement a countywide EMS Records Management System that links CAD and dispatch data, and provides the necessary information so that system managers can make informed decisions about the EMS system based on fractile response data.

Recommendation 15: Implement an Automatic Vehicle Locator (AVL) program throughout the county and adopt closest forces principles.

Recommendation 16: Place all EMS Communications on the 800MHz radio system.

9. EVALUATION OF REMSA CONTRACT

The Washoe County Health District and REMSA have a contractual agreement that defines goals, responsibilities, and other quality management measures that are intended to assure efficient and effective out-of-hospital ambulance transportation.

Contract History

The original contract between REMSA and the District Board of Health was originally approved in 1986 and has undergone several revisions. In January 2005, the Board passed the current contract known as Amended and Restated Franchise Agreement: Organizational, Performance, and Operational Criteria for the Regional Emergency Medical Services Authority.

In order to understand the contract, one must understand the organizations involved in the execution of the contract. A traditional public utility ambulance franchise model contains four main resources.

- The governmental oversight organization
- An independent oversight board that can be appointed or elected
- A contractor that provides ambulances, personnel, or other services as directed by the independent oversight board

In Washoe County, the above organizations are represented as follows:

- **Governmental Oversight** – is provided by the Washoe County District Board of Health who vests contractual oversight with the District Health Officer. The District Health Officer's staff assists in providing quality management for EMS and oversight of contract compliance.
- **Independent Oversight** – is provided by the Regional Emergency Medical Services Authority (REMSA). The Public Utility Model (PUM) concept was first used in the 1970's, with the goal of providing the ultimate public-private business model. In 1982, federal money for EMS dried up, and some municipalities look for a way to achieve the balance between quality, cost, and compassion.³⁶

³⁶ Post, C. (2010). *Lesson Seventeen: High-Performance Systems*. Retrieved from <http://www.emsvillage.com/articles/article.cfm?id=1338>

REMSA would serve to assist the Washoe County District Board in providing regulation, while also being a customer that contracts for services. REMSA would own some of the goods and services, including buildings, and ambulances. Goods or services not owned by REMSA are contracted out to a commercial provider.

Members of the independent oversight board include:

- One representative from Washoe Medical Center, Inc.³⁷;
- One representative from Saint Mary's Regional Medical Center;
- One representative from Northern Nevada Medical Center;
- One consumer appointed by the above three hospital representatives;
- One representative from the legal profession;
- One representative from the accounting profession; and
- One consumer representative.

The District Health Officer serves as an ex-officio member of the board.

The legal, accounting, and consumer representatives are appointed by the District Board of Health. Members appointed by the District Board of Health are forbidden to have certain financial dealings with the chosen ambulance contractor.

Current Ambulance Contractor

The current ambulance contractor is known as the Regional Ambulance Service Incorporated (RASI). This company was selected to provide personnel services, and other goods that REMSA needs to provide efficient and effective services.

Based on the PUM concepts, RASI is the actual contractor, and REMSA is the initial regulator. REMSA holds RASI responsible for fulfilling the contract, while the DBOH holds REMSA responsible for system performance.

The Public Utility Model in Practice – The PUM model achieved its greatest influence during the 1980's and 1990's, where up to five percent of EMS systems used the model. After 2000, municipalities started to question the efficacy of the PUM because often failed to achieve the financial success promised, local municipalities wanted to cash in on the alleged financial benefits of EMS services, insurance payors, public and private did not facilitate rules to help

³⁷ Succeeded by Renown Regional Medical Center

PUM's succeed, and the model itself became difficult to manage. By 2007, the percentage of EMS systems using the PUM was reduced to two percent.³⁸

In Washoe County, the PUM model has transposed from a pure PUM to how the system is running now. There is very little separation between REMSA and RASI, with some REMSA board members (or others within the organization) serving as RASI board members. As will be shown below, the quality management requirements imposed on REMSA should actually be imposed on RASI. We evaluated each section of the current agreements and identify system implications. Recommendations are made throughout the evaluation, except for system-wide recommendations that are included in the final chapter.

Evaluation of the Current Franchise Agreement

Below is an evaluation of the current EMS franchise agreement between the DBOH, REMSA, and RASI.³⁹ In general, the contract is confusing, very restrictive on the DBOH, and provides for token quality management requirements that lack meaningful evaluation.

Section 1 – Nevada Revised Statute 281.A400 prohibits any of the three DBOH appointees from having a pecuniary interest in the EMS system. “Pecuniary interest” is a legal term that simply means one that involves money.⁴⁰ These laws are usually enacted to avoid the appearance of conflict of interest and similar ethical issues. Some system constituents advised us of their concern involving DBOH-appointed REMSA board members having a direct pecuniary interest in the system.

Our review found that from a statutory standpoint, these three appointees met the conditions described in NRS 281A 400:

1. Except as otherwise provided in this section and NRS 281.555 and 332.800, a public officer or employee shall not bid on or enter into a contract between a governmental agency and any private business in which he has a significant pecuniary interest.
2. A member of any board, commission or similar body who is engaged in the profession, occupation or business regulated by such board or commission, may, in the ordinary course of his business, bid on or enter into a contract with any governmental agency, except the board, commission or body of which he is a

³⁸ NAEMT. (2007). EMS by the numbers. Retrieved from http://www.naemt.org/become_a_member/careers/statistics.aspx

³⁹ Washoe District Board of Health. (2005, Revised). Amended And Restated Franchise Agreement: Organizational, Performance And Operational Criteria For The Regional Emergency Medical Services Authority.

⁴⁰ Gale Group. (2008). *West's Encyclopedia of American Law*. [2nd Ed.]. The Gale Group, Inc. Retrieved from <http://legal-dictionary.thefreedictionary.com/pecuniary>

- member, if he has not taken part in developing the contract plans or specifications and he will not be personally involved in opening, considering or accepting offers.
3. A full- or part-time faculty member or employee of the Nevada System of Higher Education may bid on or enter into a contract with a governmental agency, or may benefit financially or otherwise from a contract between a governmental agency and a private entity, if the contract complies with the policies established by the Board of Regents of the University of Nevada pursuant to NRS 396.255.
 4. A public officer or employee, other than an officer or employee described in subsection 2 or 3, may bid on or enter into a contract with a governmental agency if the contracting process is controlled by rules of open competitive bidding, the sources of supply are limited, he has not taken part in developing the contract plans or specifications and he will not be personally involved in opening, considering or accepting offers. If a public officer who is authorized to bid on or enter into a contract with a governmental agency pursuant to this subsection is a member of the governing body of the agency, the public officer, pursuant to the requirements of NRS 281.501, shall disclose his interest in the contract and shall not vote on or advocate the approval of the contract.⁴¹

The Washoe County District Attorney's Office believes that the REMSA citizen representatives do not meet the NRS classification of public official. Further, the Washoe County Health District is not likely considered a type of governmental agency or political subdivision as defined by the ethics statute. This is topic deserves further attention, including case law research, and possibly an advisory opinion.

Although the current DBOH appointees are not likely to have direct pecuniary interest in the REMSA/RASI franchise agreement, the situation does raise concern. Should the REMSA law firm, accountant, or similar officials be independent of RASI? We believe that they should. We also have further concern that each hospital with a representative on the Board may also appoint one consumer representative. This should also be revisited. All members of the REMSA board should be appointed by the DBOH. This helps assure independence and limits indirect pecuniary interest, and non-pecuniary conflict of interest.

Recommendation 17: Section 1 should be redesigned to prohibit any REMSA board appointee, or their employer organization from being associated with RASI or any successor franchisees. All consumer board members should be directly appointed by the DBOH.

⁴¹ NRS 281.505

Section 5 A: Rebid or Market Share Evaluation – Originally, the exclusive franchise was to be publically bid every seven years. In 2000, the DBOH agreed to an amendment that allowed for a market share analysis to be used instead of a competitive bid. A market survey compares REMSA’s efficiency and effectiveness with similar PUM systems. The evaluations are to be performed by an independent firm agreed to by REMSA and the DBOH (or District Health Officer). If the assessment was considered acceptable, no competitive bid would be held.

The franchise agreement as amendment has caused concern from area fire department first responders. One claim involved system finance efficiencies. Compared to other PUMs, it appeared that REMSA’s cost were higher than others. Elimination of the competitive bid process was considered counterintuitive because of its questionable financial performance. The original assessment vendor was the National Association of Public Utility Models (NAPUM). There was concern that the President of REMSA, RASI, and the resident agent and treasurer of NAPUM were the same person.⁴² REMSA now uses a private consulting firm to perform the market assessment. The NAPUM has been replaced by a successor organization that is housed within one of the PUM agencies in Tulsa, OK.

We question whether the market share analysis plan should be the exclusive measure used to determine whether a competitive rebid should be waived. Further, since we believe that REMSA is the regulatory agency, the current contractor should also be assessed in the independent market analysis. Another question is whether the market analysis should be restricted to comparisons between PUMs. We appreciate the logic of comparing “apples to apples,” but this situation is more complex. Not only should efficiencies be determined on an intra-model basis, but should include an extra-model examples. This method would prevent exclusive comparisons with PUM model systems that now number less than two percent of EMS systems nationwide. If REMSA continues to use market share analysis, then no more than seven years should elapse between competitive bids to provide for service.

Recommendation 18: If REMSA continues to use market analysis, it should include intra-model and extra-model comparisons. No more than seven years should elapse without conducting a full competitive bid.

Section 7: Performance Bond – The current requirement for a \$200,000 performance bond or line of credit is inadequate. EMS is an essential community service that cannot, under any circumstances, fail to function. While the ambulance contractor has a reliable history, any commercial service can fail. Not only must government be able to step in, but it must be done without harm to the citizens. The citizens cannot be held responsible for a commercial business failure, labor situations, or even civil unrest preventing service.

⁴² Sparks Fire Department. (2010). *Clarification and prioritization of EMS issues: White paper*. Unpublished Manuscript, May 17, 2010. Sparks Fire Department.

A bond of \$200,000 will be quickly used up, leaving the county at risk. Also, there is no clause in the agreement that prohibits REMSA or the contractor from seeking injunctive relief to prevent funds from distribution. Our recent studies in Key West, FL, and Rochester, NY included designing an RFP for competitive bid. In both of these RFPs we required a \$1,000,000 surety bond or irrevocable line of credit. We also required that if the municipality declared the provider in default, and the surety bond or line of credit was invoked, that the contractor could not bring action to delay access to the funds.

Recommendation 19: Require REMSA or the contracted agency to post a surety bond, or secure an irrevocable line of credit for at least \$1,000,000. The franchise agreement should also include a clause that upon declaration of default by the District Health Officer or DBOH, either REMSA or any service contractor cannot bring legal action to delay the DBOH's access to the funds.

Section 10: Response Times – Restricting the definition of life-threatening call to “priority one” may be inadequate. Second-level priority calls are often of a serious nature and require quick response and transport. Since this variable is not directly measured, we cannot adequately assess how this affects overall response times. Also, response time requirements should be based on the medical priority dispatch program used by the PSAP. Instead of priority one or two, the response time requirement should be based on the initial MPD classification of A, B, C, D, E or Omega. Calls classified as C, D, or E should fall into the eight minute response time requirement for Sparks and Reno, and within the current time requirements within the remainder of Washoe County.

Some will argue that the eight-minute and 59 second ambulance response time standard lacks evidence of validity.⁴³ We understand such arguments but must also approach it from an efficiency standard. REMSA's operational model generates significant reliance on rapid fire department first response. Easing of expectations on the contracted ambulance service will likely increase reliance on fire department first responders who are not compensated for providing their service. Targeting the correct emergency calls for the eight minute (or area time requirements) is best accomplished through stricter use of the medical priority dispatch system.

Recommendation 20: The eight minute and 59 second response time requirement should be required for all calls classified by the PSAP as Charlie, Delta, or Echo (Priority 1 or 2).

Whenever time is used as a performance variable, there is always room for manipulation. Human behavior factors, unclear definitions for exceptions, giving the contractor unlimited discretion for self-granting of exceptions, and similar sub-variables begs the question of data authenticity. Currently, REMSA (and RASI) are permitted to decide when an exception to the eight-minute or other response time variables should be granted. Our inspection of records

⁴³ Zavadasky, M. (2012, February). Response time realities: The scientific evidence. *EMS Insider*, 39(2), 4-5, 7.

indicated that there are no specific quality management requirements for monitoring of exceptions. There are also no restrictions on when the exception may be taken, prospectively, during the call, or retrospectively. Leaving this variable to unmonitored interpretation is outside the boundaries of good quality management.

Recommendation 21: The downgrading of call priority classifications may only be done by the PSAP, PDAP, or on scene first responder. If the District Health Officer wishes to allow REMSA or the contracted agency the privilege of downgrading call classifications, it must occur prospectively (prior to ambulance dispatch), and include an explanation within the call software. The District Health Officer should monitor compliance and disqualify those downgrading without good reason or documentation. The DBOH annual franchise report should contain a summary of downgrade requests and determinations.

Another question concerns the sampling techniques used to determine sample size. In FY 2010, the County Health Officer reviewed 771 of 61,807 calls for response time compliance. We calculated that the sample size only assured a confidence level of 50%. In order to assure a practical confidence level of 90%, 2011 sample calls should be surveyed. With the availability of modern dispatch technologies, precise data and Excel type of software, there should be no reason to rely on sampling. Overall compliance rates should be calculated based on the total number of emergency calls (N =) minus calls determined to be inappropriate to count.

Recommendation 22: Response time compliance should be based on the entire population instead of sampling.

Section 10: Fines for Non-compliance – The franchise agreement allows for monetary fines to be imposed for non-compliance with the response time criteria. As of FY 09/10 the penalty per minute rate was \$15.28 per minute plus any portion above to a maximum of \$150.00 per call. During that year, the District Health Officer sustained \$39,957.20 in assessed fines. According to the District Health Officer annual audit, during FY 10, REMSA responded to 61,087 “responses.” There was no breakdown as to the total number of Priority One responses, which are the only calls for which fines are assessed. We cannot confirm whether these were all emergencies or included transfers.⁴⁴ No data were available for aeromedical responses or financial info.

Before addressing specific issues, we will discuss the reasons behind using fines to insure compliance. Monetary penalties are assessed as a catalyst for contract compliance. They are not used as a fundraising tool for the municipality. Unlike parking or red light camera citations, municipalities should not use ambulance contract fines as an expected or actual budget enhancement. That being stated, ambulance contract compliance fines must be significant as a

⁴⁴ Coulombe, E. (2011). *Franchise compliance report for the REMSA 7/01/09 through 06/30/10. Washoe County Health District*, August 16, 2011.

tool to encourage compliance. Many municipalities have enacted an ambulance compliance program, but set the terms and conditions that favor the ambulance responding late and paying a fine, instead of providing adequate staffing and units to assure compliance.

Our review of the FY2010 compliance report revealed that the above may be the case in Washoe County. Overall, \$15.28 fine per minute is likely acceptable but needs to be assessed differently. The fine should be based on both the act of late response and the degree of lateness. We suggest a fine of \$100 for being late, and an additional \$15.28 per minute, with a maximum total fine of \$250.00 per call.

Recommendation 23: Determine ambulance response time fines based on both the act of lateness and degree of lateness. Assess a \$100.00 penalty for being late and an additional \$15.28 (as per CPI changes) per minute to a maximum of \$250.00.

Currently, all fines for contract violations or late responses are placed into a fund that is used to defray community EMS education costs. Contract violation fines could be better used to offset the systemwide costs of EMS oversight. The annual DBOH franchise report should include a summary of fines imposed, the number sustained by the DHO, and the total fines collected.

Recommendation 24: Funds collected for EMS contract performance standard violations should be used to offset system wide EMS oversight costs incurred by the Washoe County DBOH.

Section 11: Rate Increases – The DBOH should have the authority to accept or reject requests for rate increases. Government oversight of private industry providing essential services must allow for this. We applaud both parties for considering alternative dispute resolution, arbitration, to settle differences. Setting up an oversight system that allows for arbitration as an appeal of what constitutes DBOH management rights is not efficient. Arbitration should be used as an alternative to litigation. By making this a contractual right, the DBOH invites this. Further, the American Bar Association, and other professional groups now question whether arbitration is less time consuming and less costly than litigation.⁴⁵

If the DBOH wishes to avail itself of alternative dispute resolution (ADR) services, it should consider using professional mediation services. These services are voluntary on the part of all parties, less formal, and clearly less costly than litigation or arbitration. The franchise agreement should not contain any provisions that insinuate that a contractor can *strong arm* the oversight agency. Regulation of reimbursement is the prerogative of the DBOH.

⁴⁵ Marinello, M. L. (2008). Protecting the natural cost advantages of arbitration. *Litigation News*, Retrieved from http://apps.americanbar.org/litigation/litigationnews/practice_areas/corporate_naturalcost.html

Recommendation 25: Remove the arbitration clause from Section 11. If ADR is considered, professional mediation is the method of choice. The District Board of Health should have the ultimate decision power over ambulance rate regulation.

Section 26: Annual Reporting Requirements – The current franchise agreement allows REMSA to submit its end of year report within 180-days after the end of the fiscal year. Annual reports should be available within 90 days. New technologies and the need for transparency make the ability and need for currency.

Recommendation 26: Require REMSA to submit their annual report to the DBOH within 90 days of the fiscal year end.

Section 30: Succession – An area of great concern to Washoe County municipalities involves the franchise agreements clause that assigns any obligations to a successor agency. For example, if the DBOH determines that local municipalities would become ambulance providers, would these municipalities be responsible for REMSA's remaining financial liabilities. A 1995 audit conducted by the City of Reno found that dissolution of REMSA could put the DBOH and the City in a position of liability.⁴⁶ This concern was echoed by the City of Sparks. In 2009, Sparks asked the Washoe County District Attorney's office for answers to a hypothetical question concerning this section. The Washoe County Attorney advised that there was no direct answer because it would depend on how the DBOH determined any successor agency or agencies would operate.⁴⁷⁴⁸ Our research confirmed that there is no direct answer to this question. What type of successor organization(s), if any, is (are) selected, would likely determine if successor responsibility could be assigned.

Another question we have concerns the ability for the DBOH to enter into an agreement that could assign liability to a branch of government or an independent city. If there were no franchise agreement, and the county operated an oversight agency, there may be no franchise to assign successor financial responsibility to. Answering this question would be critical as a precursor to any recommendation.

Recommendation 27: Cities within Washoe County should consult their legal services to provide guidance on the implications of REMSA Franchise Agreement Section 30. EMS agencies must understand that there may be no single answer to their concern.

⁴⁶ Cross, T. (1995, May). *Staff report: Internal auditor's report on the review of REMSA*. Unpublished Report. City of Reno, NV., May 17, 1995.

⁴⁷ Sparks Fire Department. (2010). *Clarification and prioritization of EMS issues: White paper*. Unpublished Manuscript, May 17, 2010. Sparks Fire Department.

⁴⁸ The Washoe County District Attorney's Office is under no obligation to provide legal advice to cities within Washoe County.

Section 31 Modification: This section allows the DBOH and REMSA to modify the agreement, by mutual consent, with formal approval of the DBOH. As we reported above, on September 17, 1997, the DHO and REMSA mutually agreed to a modification of response time criteria. While the modification was sound and within industry standards, there is no record of DBOH formal approval. Successor franchise agreements have not included the modification.

In the future, if the DBOH (or DHO) agree to modify the franchise agreement, formal DBOH approval should follow within six months.

Overall Concerns – After reviewing the history of the ambulance franchise agreements, we have some general concerns that should be addressed.

- Amendments agreed to after 2000 appear to greatly benefit REMSA while limiting DBOH oversight of the agreement.
- REMSA controlled actions, including the selection of financial auditors, market share studies, annual report timing, and similar quality management measures could impede the DBOHs' ability to accurately assess the operational and financial fitness of the franchisee.
- Regulation of rates that are clearly DBOH powers that have been muted by the need for or threat of arbitration. The DBOH does not have any obligation to cede this authority.
- Section 30 appears to *handcuff* the board from being able to rebid or reconsider how EMS is delivered.

In conclusion, the current Franchise Agreement resembles what some call a *sweetheart deal* or an example of *the fox guarding the henhouse*. While we are not recommending a new contractor, in order to consider a new contractor, the DBOH would have to:

1. Conduct a market study and determine that the contractor is not performing successfully.
2. Conduct a full RFP process.
3. If a new contractor is selected, negotiate a new contract.
4. Provide the current contractor up to two years notice of termination.

This process would likely lead to extended court battles that will be costly to all involved. Washoe County or the DBOH should not be constrained to these terms and conditions, especially when an essential public safety function is involved.

<p>Recommendation 28: Restructure REMSA to assure greater separation of the public utility oversight group (REMSA), and the contractor (RASI).</p>

10. CHALLENGES AND ADDITIONAL RECOMMENDATIONS

This chapter contains additional challenges and recommendations we believe will best serve Washoe County. Implementing the changes we recommend will not be easy. It will take the development of common ground, and participation and trust to achieve these changes.

System Development and Oversight

The lack of a true county EMS system was readily apparent from the beginning of our assessment. There is too large of a gap between individual EMS first responders and EMS transport agencies and the state EMS system. We believe that this fragments the EMS system and may compromise patient care and financial resources.

Development of a county-based oversight agency will serve as a nexus between Washoe County and the State EMS system. It will provide oversight for how the 14 EMS attributes can thrive.

We believe that the best approach would be to extend the authority of the Washoe County Health District Board and the County Health Officer to oversee and regulate the system. Individual first responder and EMS transport agencies would remain in place. Washoe County would not be expected to provide operational services.

Recommendation 29: The County Commissioners should authorize the District Health Board (or other lead agency) to create a countywide EMS oversight authority. The District Health Officer (or designated department head) would be responsible for day-to-day oversight. The DHOH would need a staff to accomplish this oversight.

A Dedicated EMS Staff– The District Health Officer (or designated County department head) should be permitted an administrative staff to include an EMS medical director, an EMS Manager, and staff personnel in charge of key areas. While administrative responsibility rests with the District Health Officer, day-to-day management would be under the EMS Manager. The EMS Manager would be responsible for total system oversight, with specific duties that involve managing the County EMS Office, EMS Multi-casualty and Disaster Management, management of the REMSA contract, County Liaison with appropriate organizations, strategic planning, and system development.

The EMS Medical Director would be responsible for all medical protocols, medical practice, liaison with the medical community, and the medical direction of dispatch, education and training, quality management, and similar matters.

Other positions should include an EMS Quality Manager, EMS Information Specialist, and an EMS Education and Training Specialist. The EMS Quality Manager would be responsible for all quality management matters involving clinical care, dispatch, operations, and other areas

assigned. The EMS Information Specialist would be responsible for implementing and monitoring the collection and analysis of all EMS system data from dispatch thru discharge from the healthcare system. The position would include analytical and technical duties. The EMS Education and Training Manager would oversee the certification, practicing privileges, and all education and training program. This position would work with the medical director to offer sound administration of educational matters.

Recommendation 30: The chosen lead agency should appoint an EMS Staff that includes: an EMS Manager, EMS Medical Director, EMS Information Specialist, EMS Quality Manager, and EMS Education and Training Manager.

Direct Costs for a County EMS System – The current economic situation may interfere with the hiring of additional EMS regulators. We attempted to determine the potential cost for adding the suggested personnel. The potential costs should be considered pro forma because employment classifications will affect compensation, benefits, and legacy costs. For example, a contracted employee will likely cost less than a municipally classified employee. Whether the savings are immediate, legacy-based, or both depend on many variables. In contrast, contracted employees usually require frequent negotiations, with higher rates of turnover. Therefore, our forecasts will provide a range of possibilities. Unless otherwise stated, these costs would occur whether the DHOB or Washoe County was the lead agency.

Washoe County EMS Manager: The Washoe County EMS Manager would be responsible for complete oversight of EMS in Washoe County, mainly from an administrative and regulatory perspective. At this time, operational responsibility is not anticipated, but could be considered for large multi-casualty or disaster situation. Table 20 lists the salary range for an EMS Manager.

Table 20: EMS Manager Salary

Position	Salary	Benefits (25%-40%)	Total
EMS Manager	\$72,800-\$123,841	\$18,200-\$49,563	\$91,000-\$173,404

The EMS Quality Manager would be responsible for several areas relating to the efficiency of the EMS system. This includes operational delivery, protocol compliance, and system efficiency. Procedural and protocol compliance includes all aspects of EMS from Medical Priority Dispatch through all levels of patient care. The EMS Quality Manager works closely with the Education and Training Division to assure that programs are based on measured patient care needs. Table 21 lists the salary range for an EMS Quality Manager.

Table 21: EMS Quality Manager Salary

Position	Salary	Benefits (25%-40%)	Total
EMS Quality Manager	\$45,126-\$102,406	\$11,282-\$40,962	\$56,408-\$143,368

The EMS information manager is responsible for the collection, storage, access, and evaluation of EMS response and clinical data. This includes the E-PCR system, all software and hardware needed. One of the main goals of this specialist is to assure a uniformed data collection and storage system that can be accessed by the appropriate personnel responsible for EMS oversight. Table 22 lists the salary range for an EMS Information Specialist.

Table 22: EMS Information Specialist

Position	Salary	Benefits (25%-40%)	Total
EMS Information Specialist	\$45,126-\$102,406	\$11,282-\$40,962	\$56,408-\$143,368

EMS Education and Training Director: The EMS Education and Training Director would be responsible for assuring that all EMS providers were properly licensed or certified, all EMS training facilities met State and local standards, all EMS instruction used for basic and continuing education met standards, and that provider agencies provided all necessary support education and training (i.e. infection control, incident command, use of personal protective equipment, safety, emergency vehicle operations, etc).

Costs for this position would be similar to those for the EMS Quality Manager and EMS Information Specialist. Table 23 shows these costs.

Table 23: EMS Education and Training Director

Position	Salary	Benefits (25%-40%)	Total
EMS Information Specialist	\$45,126-\$102,406	\$11,282-\$40,962	\$56,408-\$143,368

An Alternative for EMS Education and Training: A promising alternative for EMS Education and Training, is for the county to contract with REMSA, specifically, the Center for Prehospital Education to provide these services. There would be advantages to having a countywide training agency, especially when local government services are economically taxed. Some first responder agency employees who serve as EMS educators could be reassigned to emergency operations, thereby reducing the number of costly municipal positions. Instructors from these agencies would likely be used to augment the REMSA program, thereby supporting county public/private partnership. The Washoe County EMS Manager would have oversight of the regulatory functions, while REMSA would provide daily direction for the quality of EMS education and training.

There are other several advantages to the education and training partnership including:

- Washoe County saving the salary for an education and training director.
- REMSA could provide EMS education and training as a way to offset City and Fire District costs for providing first responder services.

- Augmenting existing EMS education and training capabilities using a system that provides these services to a wide range of community healthcare providers. EMS medical direction for education and training already exists.
- Ensuring county-wide uniformity in EMS education and training.

Any type of agreement would not prohibit a City or Fire District from augmenting the County (REMSA) provided training to fit their specific needs. A City or Fire District could even be allowed to “opt-out,” of the program, except for licensure/certification provisions. The County EMS Manager and EMS Medical Director would be able to intervene with issues concerning unfair access to training and education, or licensure/certification. Privileging would remain the right and responsibility of the individual agency and their medical director.

Recommendation 31: The designated Washoe County EMS agency should enter into an agreement with REMSA for the provision of county-wide EMS Education and Training. Granting of function privileges would remain under control of the local agency and its medical director. Local agencies could “opt-out” of or augment REMSA provided education and training. Regulatory oversight of the education and training processes would be the responsibility of the Washoe County EMS Manager and EMS Medical Director. REMSA could provide these services cost-free in exchange for EMS first responder services being provided by Cities and Fire Districts.

EMS Medical Director: The costs for a countywide EMS medical director would depend on what capacity that physician would be used in. For example, if the EMS medical director served as both the system manager and medical director, costs would be highest. If the physician was used strictly for medical oversight, the position would be part-time and be less costly. Remuneration for EMS medical directors is still a relatively new phenomenon. The National Association of EMS Physicians has taken a public position that EMS medical directors should be compensated and protected from liability.⁴⁹ The National Association of State EMS Officials also recommends that liability insurance extend beyond medical practice to include non-medical acts and omissions.⁵⁰

Recently, the San Diego County, CA advertised for an EMS Medical Director, estimating the hourly costs at \$72.00 - \$110.00 per hour.⁵¹ This is an exempt, full-time position that includes county benefits. Using these costs as a basis, a contracted medical director, working 20-

⁴⁹ NAEMSP. (2010, March). *Position Statement: Medical Direction for Operational EMS Programs*. Adopted by the National Association of EMS Physicians on March 23, 2010. Retrieved from www.naemsp.org

⁵⁰ NAEMSO. (2012). *EMS Medical Directors Professional Liability insurance*. Retrieved from <http://nasemso.org/Councils/MedicalDirectors/MDCouncilInsurance.asp>

⁵¹ San Diego County. (2012). *Job Descriptions and Salaries: EMS Medical Director*. Retrieved from <http://agency.governmentjobs.com/sdcounty/default.cfm?action=viewclassspec&ClassSpecID=79341&ViewBenefits=Yes>

hours per week would cost between \$54 and \$66 per hour (without benefits), or \$56,160-\$68,640. A small number of EMS systems have hired an EMS physician to serve as the EMS Manager and Medical Director. Physicians who have the medical and administrative credentials, plus the needed experience are hard to come by. A full-time EMS Medical Director/ Manager would likely cost approximately \$225,000 annually plus benefits (\$315,000).

Overall Costs for EMS Oversight – It is difficult to accurately pinpoint total costs for establishing EMS oversight for Washoe County. Table 24 shows a range of possibilities that could be viewed as a worst case scenario.

Table 24: Total EMS Oversight System Costs

Cost Item	Range
EMS Manager	\$91,000-\$173,404
EMS Quality Manager	\$56,408-\$143,368
EMS Information Specialist	\$56,408-\$143,368
EMS Medical Director (20-hour, contracted)	\$56,160-\$68,640
Vehicles	\$100,000
Response Equipment	\$60,000
Administrative Support	\$50,000
Total Cost	\$469,976-\$738,780

Mitigation of EMS Oversight Costs – There are several opportunities to mitigate the above costs including:

- The DBOH already staffs EMS positions that could be converted to the positions necessary for additional EMS oversight. The DBOH 2013 budget for EMS oversight is \$143,161.
- Initially, the EMS Manager position can be added with additional positions added as funding becomes available.
- Compliance enforcement fees should be used to mitigate county EMS management costs.
- The EMS Manager should seek grants for new EMS system development. These are difficult to find so system start-up and legacy costs cannot be grant dependent.
- Licensing fees could be considered for ambulance licensing, inspections, and provider licensing fees.

Regional Emergency Medical Services Authority – REMSA (RASI) appears to be providing good service to the community that it serves. Greater oversight and a renegotiation of their current contract will greatly assist with oversight. The DBOH should adjust the role of REMSA and assure greater separation between REMSA and RASI. The current franchise agreement with REMSA is not to the best advantage of the county.

Recommendation 32: REMSA should continue to be the primary EMS transport provider for its current areas. NLTFPD and Gerlach Volunteer Fire Company should also be permitted to continue its current operation as prescribed by law or policy.

Truckee Meadows/Sierra Fire Protection Districts – The newly merged fire protection districts have considerable work ahead to make their merger successful. Attempting to add an ambulance service would cause greater confusion and likely result in a less than efficient operation. At this time, the districts should continue to participate under the REMSA program.

Currently, first responder care level in Truckee Meadows is at the EMT-Intermediate level, while SFPD provides paramedic level care. It would be logical for the new, combined agency to provide the same level of care. Unfortunately, which level should be provided is the question. We are reluctant to recommend an upgrade or downgrade of care until an evidence-based decision can be made.

We also understand that Truckee-Meadows/Sierra is at a turning point due to the merger of the districts. It is difficult to split levels of care within districts. Also, the new combined fire protection district is in the process of hiring new personnel that includes numerous paramedics. The most appropriate action would be for the oversight agency to diligently influence those agencies that may have appropriate data to present it to our project manager. If this does not occur, Washoe County officials will be constrained to making decisions that may not be evidence-based.

Recommendation 33: Truckee Meadows/Sierra should continue to be served by REMSA. The current levels of first responder care should continue. After data are analyzed, a decision can be made to consider what level of care is necessary in the new Truckee Meadows/Sierra FPD. Washoe County officials should encourage agencies that may possess the necessary data to forward it to the TriData project manager for analysis.

Current Fire-First Responder Services – We were asked to determine if Reno and Sparks Fire Departments should upgrade to paramedic-level care. At this time, we do not have sufficient evidence to render an evidence-based opinion. Until a full quality management program is in place, and actual call data can be analyzed, Reno, or Sparks should not upgrade to paramedic. Efforts should be made to insure that EMT and EMT-Intermediate providers can provide the full level of care permitted by the state.

Until further data is gathered, the paramedic-level of care provided in Sierra should remain. More evidence is needed to determine whether the rest of Truckee-Meadows will benefit from upgrade to paramedic care.

Recommendation 34: At the current time, evidence is lacking to support first responder upgrade to paramedic. Current EMTs and EMT-Is should provide the maximum care available for their current level of certification.

EMS Finance – Our contract required us to analyze EMS finances that involved costs for patient care and transportation. Unfortunately, we were not provided the data to perform this analysis. Below, we will provide a pro forma assessment of expected revenues. Financial transparency is one reason why we believe that Washoe County must have greater regulatory powers of the EMS system.

We were able to calculate a pro forma calculation of the overall amount of money that is involved with first responder EMS and EMS transportation. The reader should understand that many variables could not be considered. Conservatively, EMS service under the REMSA franchise agreement is worth close to \$17,644,039. This is limited to emergency ambulance service, excluding aeromedical services, inter-facility services, and non-emergency transport.

Table 25: Forecasted Financial Worth

Item	Explanation	Data
REMSA Calls	2010 emergency calls per Reno EComm	444,400 calls ⁵²
Estimate of Patients Transported	Used a transport rate of 72%	31,968 transports
ALS – 2 (5%)	\$626.01 * 1598 transports	\$1,000,364
ALS – 1 (55%)	\$432.27 * 17,582 transports	\$7,605,446
BLS-Emergency (40%)	\$364.23 * 12,787 transports	\$4,657,409
Mileage Urban	\$8.25 mi * 8 miles * 21,482 calls	\$1,418,142
Mileage Rural	\$12.38 mi * 15 miles * 10,549 calls	\$1,958,949
Oxygen	\$33.05 * 30,370 patients	\$1,003,729
Total		\$17,644,039

First Responder Finances – Currently, fire departments within Washoe County provide REMSA with extensive first responder services. This allows REMSA to save money by fielding fewer ambulances. In return, cities or fire districts receive no compensation for that service. REMSA publically claims that their service delivery model does not cost the citizens. This claim is misleading. When considering reimbursement, this could be cash or in kind services.

Recommendation 35: REMSA should discontinue using the statement that their service is provided at no cost to the citizens.

⁵² Accuracy is questionable.

There are some who question whether receiving money for first responder services is a violation of the CMS anti-kickback statute. In our opinion, CMS opinion #06-06B will likely protect municipalities and contractors from AKA violations.⁵³ Legal advice should be obtained from appropriate legal agencies.

Recommendation 36: Municipal first responders should be reimbursed by REMSA for providing first responder services.

Two Disturbing Issue – We conclude with two issues that we found disturbing and worth mentioning. There are times when fire response load causes Reno to discontinue most EMS first responder services until fire calls diminish. The Reno area has several volunteer companies available for first response. Even if the volunteer station is physically closer, Reno SOPs and the IAFF contract prohibit volunteers from responding into the city. To bypass the closest, qualified responders because of political issues can only be called disturbing, because it does not put the patient first.

A possible compromise would be to co-dispatch a Reno unit with the closer mutual aid volunteer unit. Unfortunately, this may be counterproductive because the city may only need the volunteers when they are already too busy.

Recommendation 37: The Reno Fire Department, IAFF, and the volunteer service should work out any issues assure that the closest, qualified unit will be sent to a medical emergency.

The second issue involves the City of Reno “suspending” EMS first response when fire emergencies reach a certain level. We do not criticize the City for modifying EMS response, but total suspension, even during busy times, deserves reconsideration. Stricter use of the medical priority dispatch system may assist. The City may consider a reduced response during critical shortages, but should not suspend first response for Level D or E calls. These are situations where immediate response of trained emergency responders could be the difference between life and death.

Recommendation 38: The Reno Fire Department should not suspend responding to EMS calls, even during high volume fire responses. If reduced response is necessary, EMS first response could be limited to Priority D or E level calls.

⁵³ CMS. (2006). *OIG Advisory Opinion No. 06-06*. Department of Health and Human Services Office of the Inspector General.

11. SUMMARY OF RECOMMENDATIONS

No.	Recommendation
1	Gerlach VFD should consider the possible benefits for charging fees for EMS transportation. Alternatively, they could make an agreement with REMSA for partial reimbursement.
2	All Emergency Dispatch Centers within Washoe County should begin to collect data on arrival at patient side. They should also collect data on the time that either CPR is started or an AED is deployed.
3	Reno EComm (and successor organizations) and the Departments with volunteer fire services should develop a technological solution to decrease the impact of dispatch delays.
4	Review the incident reporting procedures between REMSA and all Fire Protection Districts and implement a unique identifier that allows for the reporting, integration, and analysis of an entire incident and not just the respective department's performance.
5	Create a lead EMS Agency, under the District Board of Health (and County Health Officer) to provide oversight over the entire EMS system, while maintaining the organizational identity of the individual provider services. This system should include a county EMS Manager, EMS Medical Director, and sufficient staff to provide regulation and oversight of access, clinical care, administration, quality management, education and training, disaster management, and evaluation. All organizations from PSAPs to healthcare systems that provide EMS in Washoe County should be part of the county-wide system.
6	Create a lead EMS Agency, under the District Board of Health (and County Health Officer) to provide oversight over the entire EMS system, while maintaining the organizational identity of the individual provider services. This system should include an EMS Manager, EMS Medical Director, and sufficient staff to provide regulation and oversight of access, clinical care, administration, quality management, education and training, disaster management, and evaluation. All organizations from PSAPs to healthcare systems that provide EMS in Washoe County should be part of the county-wide system. Alternatively, oversight could be provided by another Washoe County public safety agency.
7	Under no circumstances should the county, any city, or any fire protection district agree to provide an EMS contractor a government subsidy, or stipend to provide service.
8	The DBOH should be given the authority to, and appoint an EMS Medical Director with oversight and authority over the quality of care for the entire system. The EMS Medical Director would report to the District Health Officer, and could be a classified or contracted employee.
9	Work to assure the passage of legislation or administrative regulation providing legal protection to all constituents participating in local EMS quality management programs.
10	Accept the listed qualifications for the position of County EMS Medical Director.
11	Rename the PMAC as the EMS Medical Director Task Force to be chaired by the County EMS Medical Director. The task force would be advisory in nature.
12	Within the Washoe County District Board of Health (or selected lead EMS agency), create a data management program to generate valid, reliable, accurate, and timely information to describe the entire EMS event for the county and provide real time feedback to response agencies and the community. Cooperate with other public health and public safety and community resources to produce injury and illness surveillance reports that can be used to focus EMS efforts.
13	Combine 9-1-1/dispatch centers into one central county-wide resource so that all data is collected in one central location with singular methodology. Alternatively, develop a virtual consolidation between dispatch centers using a universal CAD or type of CAD for the county.

No.	Recommendation
14	Implement a countywide EMS Records Management System that links CAD and dispatch data, and provides the necessary information so that system managers can make informed decisions about the EMS system based on fractile response data.
15	Implement an Automatic Vehicle Locator (AVL) program throughout the county and adopt closest forces principles.
16	Place all EMS Communications on the 800MHz radio system.
17	Section 1 should be redesigned to prohibit any REMSA board appointee, or their employer organization from being associated with RASI or any successor franchisees. All consumer board members should be directly appointed by the DBOH.
18	If REMSA continues to use market analysis, it should include intra-model and extra-model comparisons. No more than seven years should elapse without conducting a full competitive bid.
19	Require REMSA or the contracted agency to post a surety bond, or secure an irrevocable line of credit for at least \$1,000,000. The franchise agreement should also include a clause that upon declaration of default by the District Health Officer or DBOH, either REMSA or any service contractor cannot bring legal action to delay the DBOH's access to the funds.
20	The eight minute and 59 second response time requirement should be required for all calls classified by the PSAP as Charlie, Delta, or Echo (Priority 1 or 2).
21	The downgrading of call priority classifications may only be done by the PSAP, PDAP, or <u>on scene first responder</u> . If the District Health Officer wishes to allow REMSA or the contracted agency the privilege of downgrading call classifications, it must occur prospectively (prior to ambulance dispatch), and include an explanation within the call software. The District Health Officer should monitor compliance and disqualify those downgrading without good reason or documentation. The DBOH annual franchise report should contain a summary of downgrade requests and determinations.
22	Response time compliance should be based on the entire population instead of sampling.
23	Determine ambulance response time fines based on both the act of lateness and degree of lateness. Assess a \$100.00 penalty for being late and an additional \$15.28 (as per CPI changes) per minute to a maximum of \$250.00.
24	Funds collected for EMS contract performance standard violations should be used to offset system wide EMS oversight costs incurred by the Washoe County DBOH.
25	Remove the arbitration clause from Section 11. If ADR is considered, professional mediation is the method of choice. The District Board of Health should have the ultimate decision power over ambulance rate regulation.
26	Require REMSA to submit their annual report to the DBOH within 90 days of the fiscal year end.
27	Cities within Washoe County should consult their legal services to provide guidance on the implications of REMSA Franchise Agreement Section 30. EMS agencies must understand that there may be no single answer to their concern.
28	Restructure REMSA to assure greater separation of the public utility oversight group (REMSA), and the contractor (RASI).
29	The County Commissioners should authorize the District Health Board (or other lead agency) to create a countywide EMS oversight authority. The District Health Officer (or designated department head) would be responsible for day-to-day oversight. The DHOH would need a staff to accomplish this oversight.
30	The chosen lead agency should appoint an EMS Staff that includes: an EMS Manager, EMS Medical Director, EMS Information Specialist, EMS Quality Manager, and EMS Education and Training Manager.

No.	Recommendation
31	The designated Washoe County EMS agency should enter into an agreement with REMSA for the provision of county-wide EMS Education and Training. Granting of function privileges would remain under control of the local agency and its medical director. Local agencies could “opt-out” of or augment REMSA provided education and training. Regulatory oversight of the education and training processes would be the responsibility of the Washoe County EMS Manager and EMS Medical Director. REMSA could provide these services cost-free in exchange for EMS first responder services being provided by Cities and Fire Districts.
32	REMSA should continue to be the primary EMS transport provider for its current areas. NLTFPD and Gerlach Volunteer Fire Company should also be permitted to continue its current operation as prescribed by law or policy.
33	Truckee Meadows/Sierra should continue to be served by REMSA. The current levels of first responder care should continue. After data are analyzed, a decision can be made to consider what level of care is necessary in the new Truckee Meadows/Sierra FPD. Washoe County officials should encourage agencies that may possess the necessary data to forward it to the TriData project manager for analysis.
34	At the current time, evidence is lacking to support first responder upgrade to paramedic. Current EMTs and EMT-Is should provide the maximum care available for their current level of certification.
35	REMSA should discontinue using the statement that their service is provided at no cost to the citizens.
36	Municipal first responders should be reimbursed by REMSA for providing first responder services.
37	The Reno Fire Department, IAFF, and the volunteer service should work out any issues assure that the closest, qualified unit will be sent to a medical emergency.
38	The Reno Fire Department should not suspend responding to EMS calls, even during high volume fire responses. If reduced response is necessary, EMS first response could be limited to Priority D or E level calls.